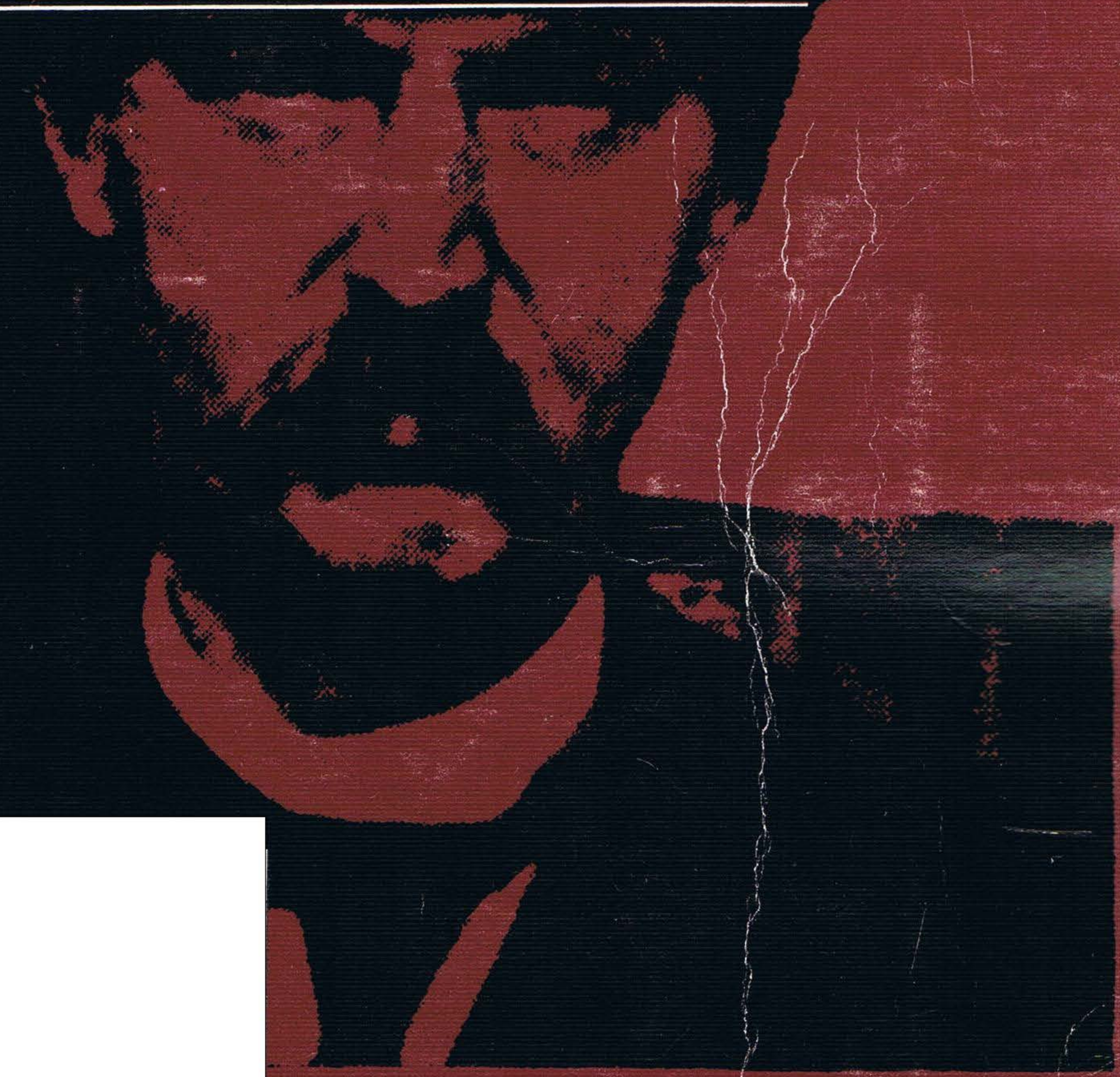
Kahl's Keys to the Ciliates



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Kahl's Keys to the Ciliates

A translation by D. J. Patterson of the keys to the level of subgenus, originally published in

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Introduction

Alfred Kahl took time off from his job as a school-teacher to write his remarkable four-part guide to the ciliates. Now, the classification that he used is dated and the terminology archaic and imprecise. He often described the different morphological variants of a species as separate species in their own right. Despite these drawbacks, and the absence of certain groups from the guide, this treatise persists as an essential text for anyone attempting to recognise free-living or ectocommensal ciliates. It is hoped that this translation will help to diminish the dual problems faced by many such people, those of understanding the language and of getting to grips with the ciliates. Hopefully, this will allow more people to have access to this diverse and fascinating group of organisms.

This translation is not meant to be used as an independent key to the ciliates but as an aid to the use of Kahl's original work. Indeed, the fine details recognised by Kahl, his idiosyncratic mode of expression and the complexity of the group oblige the reader to make frequent reference to Kahl's illustrations. Because of this, no attempt has been made to update the terminology or classification of the groups. In some cases the text has been slightly modified for clarity.

The terms relating to mouth structures have been restricted to the following: MOUTH (general term but sometimes used in a more precise way to refer to the cytostome); CYTOSTOME (the site of food vacuole formation); PHARYNGEAL (mouth structures located internal to the cytostome); ORAL (mouth structures located external to the cytostome or as a general term referring to mouth structures) and PERISTOME (cortical regions specifically associated with the mouth, but sometimes used to include oral structures).

KAHL USES THE MOUTH AS THE BASIC LANDMARK OF THE CELL, BEING LOCATED VENTRALLY. IN CELLS WITH A POLAR MOUTH, VENTRAL SURFACE IS THE LOCOMOTOR SURFACE. UNLESS THE TEXT INDICATES OTHERWISE, LEFT AND RIGHT REFER TO LEFT AND RIGHT AS SEEN WHEN VIEWED FROM OUTSIDE FROM THE DORSAL SIDE OF THE ORGANISM.

A STATEMENT ON THE CURRENT STATUS OF THE SPECIES IDENTIFIED BY KAHL CAN BE FOUND IN 'THE CILIATED PROTOZOA: CHARACTERIZATION, CLASSIFICATION AND GUIDE TO THE LITERATURE'(2ND EDITION) BY J.O. CORLISS AND PUBLISHED BY PERGAMON PRESS (1978).

IN THIS TRANSLATION THE LETTERS 'KS' REFER TO PAGES IN KAHL'S ORIGINAL TEXT, AND 'P' REFERS TO PAGES OF THE TRANSLATION.

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SUBCLASS INFUSORIA KS 43

1 (4) BODY HAVING CILIA OR CIRRI ALL OVER, OR VENTRALLY ONLY. THOSE FORMS WHICH HAVE UNCILIATED BODIES HAVE AN ADORAL ZONE OF TRANSVERSE MEMBRANELLES CURVED ROUND THE RIGHT SIDE OF THEIR MOUTH (OLIGOTRICHA AND LICNOPHORIDA). 2

2 (3) NOT HAVING AN ADORAL ZONE OF MEMBRANELLES (AZM) TO THE RIGHT OF THE MOUTH.
1 ORDER HOLOTRICHA KS 43 P 2

3 (2) MOUTH WITH AN ADORAL ZONE OF MEMBRANELLES MAINLY CURVED TO THE RIGHT (FROM THE MOUTH).
2 ORDER SPIROTRICHA KS 399 P 42

4 (1) THE BODY OF THE ADULT CILIATE HAS NO CILIA STANDING OUT FROM THE BODY APART FROM THE ANTERIOR ADORAL CILIA. THESE ARE SESSILE ANIMALS WHICH HAVE A MOBILE SWARMER WITH A POSTERIOR CILIATED WREATH OR A CILIATED STRIPE. A SMALL GROUP OF PERITRICHS, THE EPIZOIC AND MOTILE URCEOLARIIDAE HAVE A PERMANENT POSTERIOR CILIATED WREATH. 5

5 (6) BODY CONTRACTILE; HAVING AN ADORAL ROW OF CILIA WINDING TO THE LEFT FROM THE MOUTH.
3 ORDER PERITRICHA KS 651 P 72

6 (5) BODY NOT CONTRACTILE. THE ADORAL ZONE WINDS TO THE RIGHT FROM THE MOUTH. IT IS NOT MADE UP OF TRANSVERSE MEMBRANELLES.
4 ORDER CHONOTRICHA KS 799 P 82

ORDER HOLOTRICHA KS 43

1 (2) THE CYTOSTOME OPENS NEAR THE SURFACE OF THE BODY OR IN A DEPRESSION WHICH LACKS CONSPICUOUS CILIARY ORGANELLES. 1 SUBORDER GYMNOSTOMATA KS 44 P 3

2 (1) THE CYTOSTOME OPENS IN A DEPRESSION BEARING CONSPICUOUS CILIARY ORGANELLES. 3

3 (4) THE ORAL CAVITY HAS MORE OR LESS TIGHTLY PACKED ROWS OF INDEPENDENT CILIA.
2 SUBORDER TRICHOSTOMATA KS 259 P 23

4 (3) THE ORAL CAVITY IS FURNISHED WITH MEMBRANES WHICH ARE MADE UP OF ONE TO MANY ROWS OF ADHERING CILIA; SOMETIMES THERE MAY BE FREE CILIA IN ADDITION TO THESE. 3 SUBORDER HYMENOSTOMATA KS 312 P 29

FAMILIES OF GYMNOSTOMATA KS 44

1 (12) THE MOUTH IS AT THE ANTERIOR POLE OR IN THE IMMEDIATE VICINITY THEREOF.
1 TRIBE PROSTOMATA 2

2 (3) THE PROTRUDING AND LATERALLY FLATTENED ORAL REGION IS FURNISHED WITH TRICHOCYSTS.
6 FAM SPATHIDIIDAE KS 148 P 13

3 (2) ORAL REGION NOT OBVIOUS, OR ROUND IN CROSS SECTION. 4

4 (5) THE ORAL OPENING LEADS INTO AN ANTERIOR RECEPTACLE. TEST-FORMING CILIATES.
3 FAM METACYSTIDAE KS 140 P 12

5 (4) MOUTH NOT HAVING RECEPTACLE AND CILIATES NOT FORMING TESTS. 6

6 (7) THE MOUTH LIES AT THE END OF A TRUNCATED CONE, AT THE BASE OF WHICH ARE CIRRI OR TACTILE CILIA. MOST OF THE REST OF THE BODY IS NOT CILIATED.
4 FAM DIDINIIDAE KS 122 P 10

7 (6) MOUTH REGION OTHERWISE. 8

8 (9) BODY WITH REGULARLY DISPOSED SCULPTURED ECTOPLASMIC PLATES. 5 FAM COLEPIDAE KS 131 P 11

9 (8) BODY SURFACE OTHERWISE. 10

10 (11) BODY WITH RADIALLY ARRAYED, STIFF, RETRACTILE PSEUDOPODIA. 2 FAM ACTINOBOLINIDAE KS 138

11 (10) BODY WITHOUT PSEUDOPODIA.
1 FAM HOLOPHRYIDAE KS 45 P 5

12 (1) THE MOUTH OPENING IS CLEARLY DISPLACED FROM THE ANTERIOR POLE. 13

13 (18) THE MOUTH RUNS AS A SLIT FROM THE ANTERIOR POLE ALONG THE FLATTENED VENTRAL EDGE, OR IT IS ROUND AND LIES AT THE END OF A DOUBLE LINE OF TRICHOCYSTS SITUATED ON THE VENTRAL EDGE.
2 TRIBE PLEUROSTOMATA 14 P 15

14 (17) THE MOUTH IS A SLIT. 15

15 (16) THE MOUTH IS A SLIT ON THE CONVEX SIDE OF THE ANTERIOR PART OF THE BODY.
7 FAM AMPHILEPTIDAE KS 181 P 16

16 (15) THE MOUTH-SLIT IS ON THE CONCAVE SIDE OF THE ANTERIOR PART OF THE BODY.
9 FAM LOXODIDAE KS 212

17 (14) THE MOUTH IS ROUND AND IS AT THE END OF A POSTERIORLY DIRECTED LINE OF TRICHITES WHICH LIES ALONG THE CONVEX SIDE OF THE ANTERIOR PART OF THE BODY.
8 FAM TRACHELIIDAE KS 203 P 18

18 (13) MOUTH IS IN THE FRONT HALF OF THE FLAT VENTRAL SIDE. 3 TRIBE HYPOSTOMATA 19

19 (20) THE BODY IS COMPLETELY CILIATED.
10 FAM NASSULIDAE KS 216 P 20

20 (19) THE DORSAL PART OF THE BODY IS, AT MOST, PARTLY CILIATED OR HAS OCCASIONAL BRISTLES. 21

21 (22) WITH A CYTOPLASMIC SPIKE EXTENDING TO THE RIGHT FROM THE HIND END.
12 FAM DYSTERIIDAE KS 243 P 22

22 (21) NO VENTRAL SPIKE.
11 FAM CHLAMYDODONTIDAE KS 229 P 21

GENERA OF THE HOLOPHRYIDAE KS 45

1 (4) SPHERICAL TO OVAL IN SHAPE, MOSTLY PLANKTONIC IN FRESHWATER. NOT HAVING A CLEARLY DEFINED MOUTH OR PHARYNGEAL REGION. 2

2 (3) BODY IS SPHERICAL, USUALLY IN LINEAR GROUPS OF FOUR. GEN SPHAEROBACTRUM KS 57

3 (2) OVAL CELLS, TRUNCATED AT THE FRONT, WITH AN ANTERIOR DISH-LIKE ORAL DEPRESSION.
2 GEN BURSELLA KS 55

4 (1) THE FRONT END HAS A DISTINCT MOUTH OPENING, USUALLY WITH TRICHOCYSTS OR TRICHITES IN THE REGION OF THE CYTOSTOME (MAY BE OVERLOOKED EASILY IN SOME SPECIES). 5

5 (10) SMALL FORMS WITH A POLAR MOUTH, REFRACTILE, WITH DELICATE PELLICULAR ARMOUR. 6

6 (7) PELLICLE HAVING RIDGES SPIRALLING FROM FRONT RIGHT TO BACK LEFT, WITH A LINE OF DISTINCT SPOTS TO THE LEFT OF EACH SPIRAL GROOVE.
12 GEN PLACUS KS 86

7 (6) PELLICLE WITHOUT SPIRAL GROOVES. 8

8 (9) SMALL CLUB-SHAPED ANIMALS WHICH ARE SLIGHTLY CURVED TO THE VENTRAL SIDE. WITH A PROMINENT ORAL REGION AND NO CAUDAL CILIUM.
20 GEN RHOPALOPHRYA KS 108

9 (8) VERY SMALL, SLENDER BARREL OR CYLINDER-SHAPED. WITHOUT A PROMINENT MOUTH OPENING AND WITH A LONG CAUDAL CILIUM.
19 GEN PITHOTHORAX KS 107

10 (5) CELLS WITHOUT STRENGTHENED PELLICLES. 11

11 (14) SMALL (30-100 MICRONS), LATERALLY FLATTENED, LONG OVOID TO LANCET-LIKE IN SHAPE. THE ANTERIOR END IS OBLIQUELY TRUNCATED AND CARRIES THE MOUTH OPENING. 12

12 (13) MOUTH IS SLIT-LIKE LYING IN THE TRUNCATED REGION AND IT IS SURROUNDED BY A SERRATED MEMBRANE. MARINE, NO SPIRAL FURROWS.
8 GEN STEPHANOPOGON KS 66

13 (12) MOUTH LIES IN A SUBAPICAL SLIT. SMALL TO VERY SMALL FRESHWATER FORMS HAVING A LANCET-LIKE SHAPE AND WITH PELLICULAR FURROWS SPIRALLING TO THE RIGHT SIDE OF THE HIND END. (ESPECIALLY FROM MOSS).
7 GEN PLATYOPHRYA KS 65

14 (11) NOT FLATTENED, OR IF FLATTENED NOT CUT OFF OBLIQUELY TOWARDS THE VENTRAL SIDE. 15

15 (16) SMALL SLENDER OVOID FORMS TO SHORT CYLINDERS, BENT VENTRALLY SLIGHTLY HAVING A DOME OR BEAK-SHAPE AT THE FRONT END ABOVE THE PHARYNGEAL REGION.
11 GEN LAGYNOPHRYA KS 83

16 (15) CELLS OTHERWISE. 17

17 (18) MOUTH IS SMALL SLIT EXTENDING FROM THE POLE, NO TRICHOCYSTS. 3 SMALL OVAL TO SOMEWHAT IRREGULAR OVOID FORMS. 16 GEN MICROREGMA KS 102

18 (17) MOUTH DOES NOT APPEAR AS A SMALL OPEN SLIT. 19

19 (24) CELLS WITH 3 CLOSE LINES OF SHORT BRISTLES (DORSAL BRUSHES) WHICH LEAD AS A BAND OF VARIABLE LENGTH FROM THE MOUTH TOWARDS THE HIND END ON THE DORSAL SURFACE, NO PROTRUDING MOUTH. 20

20 (21) THE POLAR SLIT-LIKE MOUTH DOES NOT APPEAR TO BE OPEN, HAVING DISTINCT TRICHITES AND WHOSE OUTER END IS NOT INSUNKEN. NOT TO BE CONFUSED WITH THE FOLLOWING GENUS AND ITS SYSTEM OF DOUBLE TRICHITES.
9 GEN PSEUDOPRORODON KS 67

21 (20) MOUTH OPENING IS SLIT-LIKE, THE CYTOSTOME HAS A BASKET OF DOUBLE TRICHITES AND IS RECESSED BY ABOUT THE THICKNESS OF THE ECTOPLASM. 22

22 (23) THE REGION AROUND THE MOUTH IS FLAT.
10 GEN PRORODON KS 72

23 (22) PROMINENT ROOF-SHAPED MOUTH REGION.
SUBGEN RHAGADOSTOMA KS 82

24 (19) CELLS USUALLY WITHOUT THREE ROWS OF DORSAL BRISTLES, BUT SOME CELLS HAVE WIDELY SPACED BRISTLES; AND SOME ENCHELYODON HAVE A NARROW REGION OF DORSAL BRISTLES BUT THEY ALSO HAVE A DISTINCT PEG-LIKE MOUTH. 25

25 (34) CELL OVOID TO A SHORT CYLINDER IN SHAPE, NOT AN ELONGATED CYLINDER NOR FLASK-SHAPED; IN ANY CASE NOT WITH A BROAD, TRUNCATED, FRONT END. 26

26 (31) MOUTH PARTIALLY OR ENTIRELY SURROUNDED BY SMALL LAPPETS. 27

27 (30) MOUTH ENTIRELY SURROUNDED BY SMALL LAPPETS. 28

28 (29) HIND END UNCILIATED EXCEPT FOR A SINGLE, OR MORE OFTEN, MANY LONG CAUDAL CILIA.
3 GEN UROTRICHA KS 58

29 (28) THE HIND END IS COMPLETELY CILIATED WITHOUT SPECIAL CAUDAL CILIA.
4 GEN SPASMOSTOMA KS 61

30 (27) THE OPENING OF THE MOUTH HAS LAPPETS ONLY ON THE RIGHT, VENTRALLY IT IS DRAWN OUT AS A SHORT SLIT. SMALL OVAL CELLS WITH USUALLY ONE OR MORE CAUDAL CILIA.
5 GEN PLAGIOCAMPA KS 61

31 (26) MOUTH-OPENING WITHOUT LAPPETS. 32

32 (33) MOUTH-OPENING IS NOT A PEG-LIKE PROTRUSION.
1 GEN HOLOPHRYA KS 47

33 (32) MOUTH-OPENING ON A PEG-LIKE PROTRUSION.
SUBGEN BALANOPHRYA KS 54

34 (25) ELONGATED, CYLINDRICAL, WORM-LIKE, LANCET- OR FLASK-SHAPED FORMS; SEVERAL RELATIVELY SHORT FORMS (3:1) HAVE A TRUNCATED BROAD FRONT END. 35

35 (38) LONG LANCET- OR FLASK-SHAPED CELLS, STRONGLY FLATTENED, MOSTLY WITH BIPARTITE NUCLEI.
36

36 (37) MOUTH OPENING IS TERMINAL AND HAS A LONG FLAGELLUM-LIKE EXTENSION.
23 GEN ILEONEMA KS 116

37 (36) MOUTH OPENING DOES NOT HAVE A LONG FLAGELLUM-LIKE PROCESS. 22 GEN TRACHELOPHYLLUM KS 114

38 (35) BODY IS NOT STRONGLY FLATTENED AND NUCLEI ARE OTHERWISE. LONG CYLINDRICAL WORM- OR FLASK-SHAPED CELLS.
39

39 (40) THERE IS AN ANNULAR FURROW NEAR THE MOUTH, THROUGH WHICH THE SHORT HEAD-REGION PROTRUDES, AND THIS IS ENCIRCLED BY CLEAR SPIRAL ROWS OF CILIA.
13 GEN LACRYMARIA KS 89

40 (39) THE FRONT END DOES NOT HAVE A FURROW AND A DISTINCT, OFFSET HEAD. THESE SHOULD NOT BE CONFUSED WITH COMMON SPECIES HAVING AN UNCILIATED HEAD SET OFF BY A GROOVE. 41

41 (44) Long cylindrical, or worm-like cells, most of which are more or less extensible. 42

42 (43) Head broadens as a neck-like region which is strongly or weakly spiralled, at least when contracted. Partly contractile. With a projecting tuft of cilia at the front. 17 gen CHAENEA KS 103

A similar form with two caudal cirri.
18 gen UROCHAENEA KS 107

43 (42) Without spiral stripes when contracted, the head does not taper like a neck and there is no tuft of cilia. The pellicle appears uneven. All marine. Worm- or flask-shaped, with or without contractility. Mostly imposing or very large.
24 gen TRACHELOCERCA KS 116

44 (41) Short cylindrical, or flask-shaped animals. No or slight extensibility. Ectoplasm not normally irregular. 45

45 (46) Mouth opening is usually clearly domed.
21 gen ENCHELYODON KS 110

46 (45) Mouth round to slit-like and appears to be cut off at the front end (cut obliquely or directly across the long axis). 47

47 (48) The mouth region is thin and looks like a long cut across the front end. There is a tuft of cilia at the hind end.
15 gen CROBYLURA KS 101

48 (47) The mouth "cut" is short or not drawn out into a flat structure.
14 gen ENCHELYS KS 96

In addition, Plagiopogon Stein will be dealt with with these genera.

GENERA OF DIDINIIDAE KS 122

1 (2) THE MOUTH AREA IS POLAR, BUT WITHOUT A DISTINCT ORAL REGION. ALL, OR ONLY A CENTRAL SPOT, MAY BE USED FOR FOOD INGESTION.

5 GEN CYCLOTRICHIUM KS 129

2 (1) THERE IS A DISTINCT AND USUALLY ARMED MOUTH IN THE MIDDLE OF THE MORE OR LESS CLEARLY PROMINENT CONE-SHAPED ORAL REGION.

DIDINIIDAE S. STR. 3

3 (6) BODY WITH ONE OR SEVERAL WREATHS OF CIRRI.

4

4 (5) PECTINELLAR WREATH AROUND THE MOUTH CONE AND A FURTHER CIRRAL WREATH BEHIND THIS.

3 GEN ASKENASIA KS 127

5 (4) CIRRAL WREATH AROUND THE CONE-SHAPED MOUTH.

2 GEN MESODINIUM KS 126

6 (3) CELLS ONLY WITH WREATHS OF PECTINELLES.

7

7 (8) BODY IS EVENLY CILIATED IN ADDITION TO THE PECTINELLAR WREATH AROUND THE ORAL AREA.

4 GEN ACROPISTHIUM KS 129

8 (7) BODY HAS ONE OR SEVERAL PECTINELLAR WREATHS BUT IS OTHERWISE UNCILIATED EXCEPT FOR A SMALL GROUP OF SHORT BRISTLES.

1 GEN DIDINIUM KS 123

GENERA OF COLEPIDAE KS 131

1 (2) HIND END OF THE BODY IS ROUNDED, THE PLATES CAN BE PUSHED APART BY PRESSURE.

1 GEN COLEPS KS 131

2 (1) THE HIND END OF THE BODY IS POINTED, THE PLATES ARE FIRMLY HELD TOGETHER.

2 GEN TIARINA KS 127

GENERA OF METACYSTIDAE KS 141

1 (2) OVOID CELLS NOT HAVING A TERMINAL BLISTER, BUT WITH CAUDAL CILIA.

1 GEN VASICOLA KS 141

2 (1) CELLS NOT OVOID. 3

3 (4) SPINDLE SHAPED ANIMALS LACKING AN EXTENSIVE BLISTER. MOST HAVE A PECULIAR AND DISTINCTIVE VACUOLE IN THE HIND END, NOT HAVING CAUDAL CILIA. FINELY RIDGED.

2 GEN PELATRACTUS KS 143

4 (3) CYLINDRICAL CELLS, MOSTLY WITH A PROTRUDING SPHERICAL TERMINAL VACUOLE. MOSTLY WITH A SINGLE CAUDAL CILIUM, OCCASIONALLY MORE.

3 GEN METACYSTIS KS 144

GENERA OF SPATHIDIIDAE KS 148

1 (16) THE MOUTH DOES NOT STRETCH ALONG THE BODY AS A REGION BEARING TRICHOCYSTS. BODY WITHOUT TRICHOCYST-BEARING WARTS OR TENTACLES. 2

2 (13) MOUTH REGION WITHOUT DORSAL WARTS. THERE ARE SOME FORMS WITH SNOUT-LIKE APPENDAGES, LIKE SPATHIDIUM PAPILLIFORME - WHICH HAS THREE WARTS ON THE MOUTH. THE MOUTH DOES NOT HAVE THREE TENTACULAR ARMS. 3

3 (12) THE TRICHOCYSTS OF THE MOUTH ARE NOT CONCENTRATED INTO A DORSAL BUNDLE. 4

4 (11) BOTH SIDES OF THE BODY ARE EVENLY CILIATED. 5

5 (10) THE ORAL REGION IS CLOSED ANTERIORLY. 6

6 (7) SMALL HYALINE CELLS WITH A SEMI-RIGID PELLICLE AND AN ANTERIOR BEAK PROTRUDING FROM THE DORSAL SIDE. SUBGEN SPATHIDIELLA KS 169

7 (6) CELL OTHERWISE. 8

8 (9) THE MOUTH TERMINATES AT AN UNCILIATED REGION WHICH EXTENDS TO THE MIDDLE OF THE BODY. THE CILIARY ROWS ARE CONCENTRIC AROUND THIS AREA. FROM MOSS. USUALLY 80-100 MICRONS.
1 GEN BALANTIDIOIDES KS 149

9 (8) THE VENTRAL SURFACE DOES NOT HAVE A CILIA FREE ZONE. CILIARY ROWS ARE LONGITUDINAL.
2 GEN SPATHIDIUM KS 149

10 (5) THE MOUTH APPEARS OPEN AT THE FRONT OF THE CELL.
4 GEN ENCHELYDIUM KS 170

11 (4) BODY CILIATED ONLY ON THE RIGHT SIDE, LONG WORM-LIKE CELL. 5 GEN HOMALOZOON KS 172

12 (3) TRICHOCYSTS OR TRICHITES HEAPED INTO A BUNDLE AT THE ANTERIOR END AND BEING ABSENT ELSEWHERE.
6 GEN CRANOTHERIDIUM KS 172

13 (2) THE MOUTH REGION HAS A DORSAL TRICHOCYST-BEARING WART OR THE MOUTH IS SURROUNDED BY THREE TENTACLE-LIKE ARMS. 14

14 (15) THE MOUTH REGION HAS A DORSAL TRICHOCYST-WART.
3 GEN SPATHIDIOIDES KS 167

15 (14) THE MOUTH IS SURROUNDED BY THREE TRICHOCYST-BEARING TENTACLES. 11 GEN TEUTOPHRYS KS 176

16 (1) THE MOUTH-REGION EXTENDS VENTRALLY IN A TRICHOCYST-BEARING STRIPE, OR EXTENDS OVER THE WHOLE OF THE BODY. THERE MAY BE WARTS OR TENTACLES BEARING TRICHOCYSTS. 17

17 (22) BODY HAS A RIDGE OF TRICHOCYSTS, BUT WITHOUT TENTACLES OR WARTS. 18

18 (21) BODY RIDGE DRAWN OUT, SPIRALLING TOWARDS THE RIGHT AT THE HIND END. 19

19 (20) THE FRONT END IS MORE OR LESS VENTRALLY TRUNCATED, NOT DRAWN OUT INTO TWO HORNS.
8 GEN PERISPIRA KS 174

20 (19) FRONT END DRAWN OUT INTO TWO HORNS.
9 GEN DICERAS KS 175

21 (18) THE BODY RIDGE IS SUBSTANTIALLY LONGITUDINAL.
7 GEN PENARDIELLA KS 173

22 (17) BODY WITH WART-LIKE OR TENTACLE-LIKE TRICHOCYST-BEARING STRUCTURES.
10 GEN LEGENDREA KS 175

FAMILIES OF THE TRIBE PLEUROSTOMATA KS 181

1 (4) Mouth is on the convex ventral side. 2

2 (3) Mouth is a long slit.
1 fam AMPHILEPTIDAE KS 181 P 16

3 (2) The mouth is round and at the end of a ridge bearing trichocysts/trichites.
2 fam TRACHELIIDAE KS 203 P 18

4 (1) The mouth is on the concave ventral side.
3 fam LOXODIDAE KS 212

GENERA OF AMPHILEPTIDAE KS 181

1 (4) Both sides of the body are evenly ciliated.
2

2 (3) The mouth slit does not extend to the middle of the body and is not flanked by trichocysts.
1 gen AMPHILEPTUS KS 182

3 (2) The entire ventral edge has a broad band containing numerous trichocysts.
2 gen BRYOPHYLLUM KS 183

4 (1) Only the right side of the body is evenly ciliated. 5

5 (6) Ventrally, the body has a flattened band of trichocysts; dorsally there may be a similar band or trichocyst-warts.
5 gen LOXOPHYLLUM KS 195

6 (5) Without the band either dorsally or ventrally.
7

7 (8) The left side is completely without cilia.
3 gen LIONOTUS KS 185 P 17

8 (7) Part of the ciliated right side extends over the dorsal line to the left side so that this is half ciliated posteriorly. The mouth region is dorsally curved to the left.
4 gen ACINERIA KS 195

SUBGENERA OF LIONOTUS KS 185

1 (2) THE LEFT SIDE OF THE BODY IS NOT MARKEDLY DOMED, BEING ONLY SLIGHTLY SO, AND IT DOES NOT HAVE A CLEAR BREAK BETWEEN IT AND THE NECK AND THE TAIL ON THE ONE HAND, NOR WITH THE UPPER RIGHT SIDE ON THE OTHER. THE ROWS OF CILIA OF THE RIGHT SIDE ARE PUSHED TOGETHER AT THE FRONT TO FORM A 'SPICA'. OFTEN MORE THAN ONE CONTRACTILE VACUOLE LYING IN A VENTRAL ROW.

SUBGEN HEMIOPHRYS KS 186

2 (1) THE LEFT SIDE OF THE BODY IS USUALLY MARKEDLY DOMED (CURVED), AND HAS A SHARP BORDER WITH THE FLAT RIGHT SIDE. THE CILIARY ROWS DO NOT FORM AN ANTERIOR 'SPICA'. THE CONTRACTILE VACUOLE IS USUALLY SINGLE, BUT THOSE SPECIES WITH MORE THAN ONE CONTRACTILE VACUOLE MIGHT, WITH FURTHER STUDY, BE BETTER PLACED WITH HEMIOPHRYS.

SUBGEN LIONOTUS KS 191

GENERA OF TRACHELIIDAE KS 203

1 (4) THE FRONT END OF THE BODY EXTENDS AS A SNOUT OR FINGER-LIKE PROJECTION. FREE-LIVING CELLS. 2

2 (3) LANCET-LIKE HAVING THE HIND END DRAWN OUT LIKE A TAIL, OR POINTED, BUT ROUNDED IN ONE FORM FROM MOSS. 2 GEN DILEPTUS KS 204

3 (2) THE FORM OF THE BODY IS OVAL TO SPHERICAL, THE HIND END IS ROUNDED OR HAS AN INDISTINCT POINT. 3 GEN TRACHELIUS KS 210

4 (1) THE BODY NARROWS OFF, LANCET-LIKE, IN FRONT OF THE MOUTH, LIKE AMPHILEPTUS. FROM ASELLUS AND GAMMARUS. 1 GEN BRANCHIOECETES KS 203

FAMILIES OF HYPOSTOMATA KS 215

1 (2) CILIATED ALL OVER; SOMETIMES THE CILIA ARE SOMEWHAT LESS DENSE DORSALLY THAN VENTRALLY.
1 FAM NASSULIDAE KS 216 P 20

2 (1) NOT CILIATED DORSALLY, BEARING AT MOST A FEW BRISTLES. 3

3 (4) NO SPIKE AT THE BACK ON THE VENTRAL SIDE.
2 FAM CHLAMYDODONTIDAE KS 229 P 21

4 (3) THERE IS A POSTERIOR PLASMATIC SPIKE ON THE VENTRAL SIDE AT THE BACK AND TO THE RIGHT.
3 FAM DYSTERIIDAE KS 243 P 22

GENERA OF NASSULIDAE KS 216

1 (2) THE OPENING OF THE BASKET LIES IN AN ORAL VESTIBULE, THE OUTER OPENING OF WHICH IS CLOSED OFF BY A SECOND MEMBRANE.

1 GEN NASSULA KS 216

2 (1) THE OPENING OF THE NASSE LIES ON THE SURFACE OR AT THE BASE OF A SHALLOW DEPRESSION WHICH OPENS OUTWARDS. 3

3 (4) THE BASKET LIES IN A MARKED DEPRESSION AT THE FRONT END OF WHICH, AND THIS IS DIFFICULT TO SEE, THERE IS A MEMBRANOID OR CILIA. SLENDER OVAL ANIMALS WHICH ARE MORE OR LESS FLATTENED. SOME CELLS HAVE A CLEAR LAYER OF TRICHOCYSTS.

2 GEN CYCLOGRAMMA KS 223

4 (3) BASKET REGION OPENS ONTO THE SURFACE WITHOUT A MARKED DEPRESSION. USUALLY NOTICEABLY FLATTENED CELLS WITHOUT TRICHOCYSTS. 5

5 (6) THE BEAK AT THE LEFT MARGIN OF THE BODY IS ABSENT OR POORLY DEVELOPED. THE BASKET OPENING IS MEDIAN.

3 GEN CHILODONTOPSIS KS 225

6 (5) THERE IS A CLEAR PROJECTING BEAK FROM THE LEFT MARGIN OF THE BODY IN THE REGION OF THE MOUTH. THE OPENING OF THE BASKET IS CLEARLY DIRECTED TO THE RIGHT.

4 GEN ORTHODON KS 228

GENERA OF THE FAMILY CHLAMYDODONTIDAE KS 229

1 (2) THE CILIATED REGION OF THE BODY IS SEPARATED FROM THE NON-CILIATED REGION BY A NARROW HYALINE AND CROSS-STRIATED BAND.

1 GEN CHLAMYDODON KS 229

2 (1) WITHOUT A SEPARATING BAND BETWEEN THE TWO SURFACES. 3

3 (4) THE CILIATED REGION ON THE VENTRAL SIDE IS LIMITED TO A STRIPE WHICH TAPERS FROM THE FRONT TO THE BACK, AND HAS THE UNCILIATED REGION EXTENDING OVER THE TWO MARGINS.

2 GEN PHASCOLODON KS 232

4 (3) THE CILIATED REGION IS NOT RESTRICTED LIKE THIS. 5

5 (6) THE MOUTH IS AN ANGLED SLIT IN THE FRONT QUARTER AND HAS A FLAPPING PREORAL MEMBRANE.

3 GEN GASTRONAUTA KS 233

6 (5) THE MOUTH OPENING IS ROUND. 7

7 (8) THE MOUTH HAS A DISTINCT BASKET. THERE IS AN ANGLED ROW OF BRISTLES ARISING DORSALLY FROM THE FLATTENED FRONT PART OF THE CELL.

6 GEN CHILODONELLA KS 234

8 (7) THE RODS OF THE BASKET ARE NOT CLEAR, THE FLATTENED ANTERIOR DORSAL REGION DOES NOT HAVE THE ANGLED ROW (OF BRISTLES). THERE ARE DORSALLY DIRECTED SPIKES AROUND THE ENTIRE EDGE OF THE BODY.

5 GEN CRYPTOPHARYNX KS 234

GENERA OF DYSTERIIDAE KS 244

1 (2) VENTRAL SIDE COMPLETELY CILIATED. THE BUCCAL REGION HAS SHORT PLUMP RODS.
1 GEN HARTMANNULA KS 244

2 (1) VENTRAL SIDE WITH AT LEAST ONE UNCILIATED EDGE. 3

3 (4) VENTRAL CILIATURE IS BORDERED ON BOTH SIDES BY NARROW (CILIA-FREE?) ZONES. A BIG POSTERIOR SPIKE FORMS AS A CONTINUATION OF THE STRONGLY TAPERING BODY. 2 GEN SCAPHIDIODON KS 245

4 (3) VENTRAL CILIATURE PARTICULARLY REDUCED ON THE LEFT SIDE. 5

5 (6) IN ADDITION TO THE RIGHT SIDE OF THE BODY THERE IS A FURTHER POSTORAL PART WHICH IS CILIATED VENTRALLY IN LONGITUDINAL ROWS. THESE ROWS SHORTEN GRADUALLY FROM THE RIGHT TO THE LEFT.
3 GEN TROCHILIOIDES KS 245

6 (5) THE POSTORAL VENTRAL SURFACE CILIATURE IS COMPRISED OF ONLY A FEW ROWS WHICH ARE AN EXTENSION OF THE PREORAL ROWS. THESE GO ROUND TO THE RIGHT OF THE MOUTH AT THE BACK, MORE OR LESS PARALLEL TO THE RIGHT EDGE. OTHERWISE, AT MOST, 1 OR 3 SHORT, OBLIQUE, ADORAL ROWS. 7

7 (8) THE CILIATED SIDE OF THE VENTRAL SURFACE IS QUITE FREE AND HAS A CHARACTERISITIC APPEARANCE.
4 GEN TROCHILIA KS 248

8 (7) THE CILIATED FIELD IS MORE OR LESS COVERED VENTRALLY BY AN ECTOPLASMIC PROJECTION FROM THE UNCILIATED VENTRAL SIDE. THE CILIATED FIELD LIES IN A FURROW OPENING TO THE RIGHT. THE ANIMALS OFTEN MOVE BY CRAWLING ON THE NARROW RIGHT SIDE; THE MOUTH AREA AND THE FRONTAL REGION ARE ENCLOSED IN A GROOVE BY THE VENTRAL REGION.
5 GEN DYSTERIA KS 250

FAMILIES OF TRICHOSTOMATA KS 259

1 (2) SMALL OVOID INFUSORIA WITH A CILIATED PERISTOMIAL GROOVE AROUND THE MOUTH. IN SOME CASES IT IS PULLED PARTLY ROUND THE FRONT (OF THE CELL?) - THESE CAN ALSO BE DISTINGUISHED BY HAVING SENSORY CILIA BORNE ON A PAPILLA. MAY FORM A FRAIL GELATINOUS TEST. SWIM BACKWARDS. COMPARE WITH OPISTHOSTOMUM.

9 FAM MARYNIDAE KS 296 P 27

2 (1) OTHERWISE, WITHOUT TEST. 3

3 (4) SMALL; MOSTLY LATERALLY FLATTENED AND WITH DELICATE PELLICULAR SUPPORT. WEAKLY CILIATED, MAINLY ON THE RIGHT FLAT SIDE. CILIA LIE IN A CONTINUOUS ROW ALONG THE SEMICIRCULAR OR SICKEL-SHAPED DORSAL KEEL, AND IN 2-9 DISCONTINUOUS ROWS IN THE MIDDLE OF THE BODY. THE MOUTH IS ON A FLATTENED VENTRAL FOLD, USUALLY WITH MEMBRANOIDS WHICH ARE DIFFICULT TO SEE (NOT TO BE CONFUSED WITH THE SUPERFICIALLY SIMILAR CTENOSTOMATA WHERE THE MOUTH HAS 8 MEMBRANELLES ARRANGED LIKE THE TEETH OF A COMB). ALSO DISTINGUISHED BY THE PRESENCE OF TWO CONTRACTILE VACUOLES.

10 FAM TRICHOPELMIDAE KS 299 P 28

4 (3) OTHERWISE IN SHAPE AND CILIATION. 5

5 (6) SMALL TO VERY SMALL CELLS WITH LONG TAIL CILIA. THE SOMATIC CILIA ARE PULLED AROUND ONLY THE ANTERIOR HALF AS THREE TO FOUR OBLIQUE SPIRALS.

1 FAM SCIADOSTOMIDAE KS 260

6 (5) OTHERWISE IN FORM AND CILIATURE, NO INDIVIDUAL TAIL CILIA. 7

7 (10) THERE IS A SPIRAL ZONE OF SPECIAL CILIA LEADING FROM THE MOUTH TO THE HIND END. 8

8 (9) SPIRAL ZONE APPARENTLY EXTENDING FROM FRONT RIGHT TO BACK LEFT.

2 FAM SPIROZONIDAE KS 261

9 (8) SPIRAL ZONE APPARENTLY EXTENDING FROM FRONT LEFT TO BACK RIGHT. 3 FAM TRICHOSPIRIDAE KS 262

10 (7) WITHOUT SPECIAL SPIRAL CILIARY ROW. 11

11 (12) IN APPROXIMATELY THE FIRST FIFTH OF THE VENTRAL SIDE THERE IS AN ANGLED CILIATED GROOVE LEADING TO THE MOUTH.
4 FAM PLAGIOPYLIDAE KS 262 P 25

12 (11) WITHOUT THE VENTRAL ANGLED GROOVE 13

13 (14) THE MOUTH IS IN THE FIRST QUARTER IN A LONGITUDINAL FLAT OVAL CAVITY, THE WALLS OF WHICH ARE EVENLY DENSELY CILIATED.
5 FAM CLATHROSTOMIDAE KS 270

14 (13) THE MOUTH TAKES THE FORM OF A SUNKEN FUNNEL.
15

15 (16) THE ORAL FUNNEL HAS DISTINCT CILIATION. AT THE BACK OF THIS, NEAR THE MIDDLE OF THE BODY IS AN ADORAL DEPRESSION WHICH IS ANGLED TO THE RIGHT POSTERIORLY.
8 FAM PARAMECIIDAE KS 289

PROVISIONALLY, THE NEW GENUS PHYSALOPHRYA IS ADDED HERE. THE ADORAL DEPRESSION IS SIMILARLY ORGANISED BUT LACKS A PREORAL FUNNEL NEAR THE FRONT END.

16 (15) WITHOUT THE FUNNEL STARTING AT THE FRONT END.
17

17 (18) FREE-LIVING CELLS MOSTLY FROM MOSS. THE ORAL FUNNEL HAS A TUNNEL LIKE ENTRANCE WITH ONE CILIATED REGION ON THE FLOOR AND A SECOND ON THE ROOF.
6 FAM COLPODIDAE KS 271 P 26

18 (17) FROM MUSSELS OR LAND SNAILS.
7 FAM CONCHOPHTHIRIDAE KS 285

GENERA OF UNCERTAIN POSITION: PROTOCRUCIA, BLEPHAROSTOMA, COLPODOPSIS; IN ADDITION THERE ARE THE RECENTLY DESCRIBED GENERA STOKESIA, SULCIGERA, OPISTHOSTOMUM, ENTORHIPIDIUM. THESE FOUR GENERA EACH FORM A SEPARATE FAMILY.

GENERA OF PLAGIOPYLIDAE KS 262

1 (6) THE PERISTOMIAL REGION HAS A CLEARLY CILIATED GROOVE, OR CAVITY. 2

2 (5) THE PERISTOMIAL GROOVE WHICH BEGINS ON THE DORSAL SIDE NEAR THE RIGHT EDGE, MEETS THAT EDGE WHERE IT FORMS A DISTINCT NOTCH. THE PELLICLE DOES NOT HAVE A GELATINOUS COATING. 3

3 (4) FREE-LIVING (NOT FROM SEA-URCHINS, OR THE LIKE).
1 GEN PLAGIOPYLA KS 264

4 (3) LIVING IN SEA-URCHINS.
2 GEN LECHRIOPYLA KS 267

5 (2) THE PERISTOMIAL GROOVE BEGINS VENTRALLY AT THE RIGHT EDGE - THERE IS NO NOTCH. IT MAY BE SHORTENED TO A MERE DEPRESSION. THE PELLICLE IS COVERED WITH A GELATINOUS LAYER.
3 GEN SONDERIA KS 267

6 (1) PERISTOME HAS A PROMINENT STIFF SICKEL-SHAPED EDGE BUT WITHOUT A CILIATED GROOVE OR DEPRESSION. VERY SMALL CELLS (20 MICRONS) WITH THE CONTRACTILE VACUOLE LYING IN THE FIRST QUARTER ON THE RIGHT.
4 GEN SONDERIELLA KS 270

GENERA OF COLPODIDAE KS 272

1 (6) THE MOUTH IS A FUNNEL SHAPED DEPRESSION.
2

2 (5) THE ORAL FUNNEL HAS NOT BECOME A CAVITY OCCUPYING ALMOST THE ENTIRE FRONT HALF OF THE BODY.
3

3 (4) THE MOUTH OPENS FROM THE BROAD SIDE. THE RIGHT SIDE AND THE BACK PART OF THE LEFT SIDE (OF THE MOUTH) ARE PULLED AROUND TO FORM A HORSESHOE SHAPE. THE FRONT PART OF THE LEFT SIDE BEARS A DISTINCT MEMBRANOID OF FUSED CILIA ANGLED BACKWARDS.
4 GEN BRYOPHRYA KS 284

4 (3) THE MOUTH OPENS BY A PASSAGE RATHER MORE FROM THE NARROWER LEFT SIDE. THERE IS ALWAYS AN ANGLED FIELD OF CILIA ON THE LEFT OF THE MOUTH BUT NO MEMBRANE. 1 GEN COLPODA KS 273

5 (2) THE ORAL FUNNEL IS ALWAYS DEEPLY INSUNKEN AND FORMS A BROAD CAVITY. PARTLY CILIATED WITH NORMAL CILIA. EATS CILIATES ETC.
3 GEN BRESSLAUA KS 283

6 (1) THE MOUTH IS A LONG TUBE OR A NARROW DIAGONAL INVAGINATION.
7

7 (8) THE MOUTH IS A LONG CILIATED CURVED TUBE. SIMILAR TO COLPODA BUT FOUND IN STAGNANT WATER.
2 GEN TILLINA KS 282

8 (7) THE MOUTH TAKES THE FORM OF A FLAT CLEFT-LIKE, DIAGONAL INVAGINATION. LIKE CHILODON. MARINE.
5 GEN WOODRUFFIA KS 285

GENERA OF MARYNIDAE KS 296

1 (2) THE PERISTOMIAL GROOVE FORMS A COMPLETE CIRCLE AT THE FRONT END. THE HEAD IS SEPARATED DORSALLY FROM THE REST OF THE BODY. VENTRALLY AND TO THE LEFT OF THE MOUTH THE HEAD HAS A LONG SLIT WHICH CONTINUES ON THE BODY WALL. LIVES SOCIALLY IN DICHOTOMOUSLY DIVIDING GELATINOUS MATRIX.

1 GEN MARYNA KS 297

2 (1) DORSALLY THE HEAD IS A DIRECT CONTINUATION OF THE BODY WALL. THE PERISTOMIAL GROOVE ENCIRCLES ONTO THE VENTRAL SIDE SO THAT THE HEAD IS NOT SEPARATED FROM THE REST OF THE BODY ON THE DORSAL SIDE AND DOES NOT HAVE A VENTRAL SLIT. SMALL CELLS, 40-60 MICRONS. HAVING INDIVIDUAL GELATINOUS SHEATHS.

2 GEN MYCTEROTHRIX KS 297

GENERA OF TRICHOPELMIDAE KS 300

1 (4) THE ORAL REGION IS SUPPORTED BY TRICHITES WHICH MAY BE DIFFICULT TO SEE, AND IT OPENS AT THE SURFACE IN THE FIRST QUARTER OR THIRD OF THE BODY. 2

2 (3) THE ORAL REGION EXTENDS ALONG THE UPPER RIGHT EDGE ALMOST WITHOUT A BREAK. THERE IS A MEMBRANELLE WHICH IS DIFFICULT TO SEE TO THE LEFT OF THE MOUTH.
1 GEN PSEUDOMICROTHORAX KS 300

3 (2) THE ORAL REGION IS CLEARLY RESTRICTED, AND THE OPENING IS MORE STRONGLY DIRECTED TO THE LEFT. TO THE LEFT OF THE MOUTH ARE 2 OR 3 CIRRI OR MEMBRANELLE-LIKE STRUCTURES.
2 GEN TRICHOPELMA KS 301

4 (1) THE MOUTH IS UNSUPPORTED AND VIRTUALLY NOT RECOGNIZABLE. OPENS VENTRALLY IN THE MIDDLE OR NEAR THE BACK.
5

5 (6) THE ORAL DEPRESSION IS SMALL AND OPENS TO THE LEFT IN THE MIDDLE OF THE BODY. IT HAS A SMALL MEMBRANELLE. 3 GEN DREPANOMONAS KS 304

6 (5) THE MOUTH IS A SMALL DEPRESSION NEAR THE HIND END ON THE LEFT SIDE, AND IS SOMEWHAT DISPLACED ON THE VENTRAL SIDE. IT OPENS TO THE LEFT VENTRALLY, ALMOST ALWAYS HAVING A SMALL MEMBRANELLE.
4 GEN MICROTHORAX KS 305

THERE IS A VERY SMALL SIMILAR FORM FOUND IN MOSS, KREYELLA, WHICH IS PLACED WITH MICROTHORAX. THIS DOES NOT BELONG TO THIS FAMILY, IT HAS A SINGLE CONTRACTILE VACUOLE LYING TO THE RIGHT NEAR THE HIND END.

FAMILIES OF HYMENOSTOMATA KS 313

1 (2) THE ORAL CAVITY IS NOT ASSOCIATED WITH A PERISTOMIAL DEPRESSION. 1 FAM FRONTONIIDAE KS 313 P 30

2 (1) THE ORAL CAVITY LIES AT THE END OR THE BOTTOM OF A PERISTOME. 3

3 (4) THE PERISTOME (LEADS) FROM THE INSUNKEN ORAL CAVITY TO OPEN PERPENDICULAR TO THE BODY WALL AS A SICKLE-SHAPED CILIATED SLIT. THE FRONT END OF THE PERISTOME IS SHAPED LIKE AN HOUR GLASS.
2 FAM OPHRYOGLENIDAE KS 359

4 (3) THE PERISTOME LEADS ON THE SURFACE OF THE BODY FROM THE FRONT END TO THE MOUTH REGION. 5

5 (6) THE PERISTOME HAS A TRANSPARENT SINGLE-LAYERED MEMBRANE TO ITS RIGHT, WHICH ENCLOSES THE POSTERIOR END OF THE MOUTH REGION AS A POCKET. THERE IS A ROW OF CILIA OR A MEMBRANE TO THE LEFT SIDE.
5 FAM PLEURONEMATIDAE[1] KS 374 P 38

6 (5) PERISTOME OTHERWISE. 7

7 (8) THERE ARE TWO SINGLE-LAYERED UNDULATING MEMBRANES TO THE RIGHT OF THE PERISTOME. THERE IS NO CLEAR ECTOPLASMIC POCKET ENCLOSING THE MOUTH.
4 FAM LEMBIDAE KS 368

8 (7) THE GROOVE OF THE PERISTOME IS LINED WITH A TIGHTLY PACKED FIELD OF CILIA AND HAS AN UNDULATING MEMBRANE ON THE RIGHT SIDE, OR WITH ONLY A THICK UNDULATING MEMBRANE ON THE RIGHT. TO THE RIGHT OR TO THE BACK OF THE MOUTH IS A POCKET, WITH A SMALL MEMBRANE, SUNKEN INTO THE ECTOPLASM.
3 FAM PHILASTERIDAE KS 363 P 37

[1]INCLUDED WITH THE PLEURONEMATIDAE ARE: THE ECTOCOMMENSAL GENUS LARVULINA FROM ASELLUS; THE FAMILY ANCISTRUMIDAE FROM THE MANTLE CAVITY OF MARINE BIVALVES AND THE TWO FORMS IN THE SUBFAMILY HEMISPEIRINAE FROM ECHINODERMS. 40

GENERA OF FRONTONIIDAE KS 314

NOTE : THE MARINE ENTOZOIC GENERA EURYCHILUM AND CRYPTOCHILIDIUM ARE INCLUDED ON KS 337-338.

1 (42) WITH THE EXCEPTION OF THE EASILY RECOGNIZABLE GENUS LEMBADION (OF WHICH THE BUCCAL REGION EXTENDS FROM THE FRONT TO THE LAST SIXTH OF THE ANIMAL) THERE ARE NO SUBSTANTIAL, LONG, CAUDAL CILIA AND THERE IS NEVER A SINGLE LONG TERMINAL CILIUM. CAUDAL CILIA ARE ABSENT OR ONLY SLIGHTLY LONGER THAN NORMAL, BEING RECOGNIZED BY THEIR STIFFNESS. 2

2 (17) THE MOUTH OPENING IS POINTED ANTERIORLY. 3

3 (12) THE MOUTH IS AT LEAST ONE THIRD OF THE LENGTH OF THE BODY. 4

4 (9) THE HIND END OF THE MOUTH IS CUT OFF AT AN ANGLE, THERE IS A DISTINCT UNDULATING MEMBRANE TO THE LEFT, AND ON THE RIGHT ARE SHORT CILIA WHICH ARE PARTLY FREE AND PARTLY FUSED INTO A MEMBRANOID. 5

5 (8) MOUTH LACKS POSTERIOR FUNNEL-LIKE PHARYNX. 6

6 (7) FIBRILS ASSOCIATED WITH THE MOUTH ARE STRONG AND NUMEROUS AND THERE IS A CLEAR FUSION LINE FROM BEHIND THE MOUTH TO THE POSTERIOR POLE. THERE IS NO DORSAL STRIATED BAND TOWARDS THE BACK. NOT EQUALLY TAPERED ON THREE SIDES TOWARDS THE HIND END. 1 GEN FRONTONIA KS 316

7 (6) FIBRILS ASSOCIATED WITH THE MOUTH ARE DELICATE AND SPARSE. THE FUSION LINE BEHIND THE MOUTH IS NOT CLEAR. THERE IS A CLEAR DORSAL STRIP AT THE BACK. POSTERIORLY IT TAPERS FROM THREE SDIES. 3 GEN DISEMATOSTOMA KS 322

8 (5) THE MOUTH HAS A DEEP-SET FUNNEL-LIKE ORAL STRUCTURE (PHARYNX) LEADING BACKWARDS. MEMBRANES EXTEND INTO THE LEFT SIDE OF THIS.
2 GEN FRONTONIELLA KS 322

9 (4) THE MOUTH IS NOT CUT OFF AT AN ANGLE POSTERIORLY BUT IS POINTED OR ROUNDED OR DRAWN OUT.
10

10 (11) THE MOUTH IS A SMALL SIGMOID SLIT LYING AWAY FROM THE FRONT POLE AND HAVING TWO MEMBRANES.
GEN SIGMOSTOMUM KS 322

11 (10) THE LARGE MOUTH CLEARLY BEGINS AT THE FRONT POLE. IT HAS TWO MEMBRANES. THE BUCCAL REGION HAS LONG FIBRILS. 4 GEN LEUCOPHRYDIUM KS 323

12 (3) MOUTH IS HALF TO FOUR/FIFTHS THE LENGTH OF THE BODY.
13

13 (16) THE MOUTH IS ABOUT HALF THE LENGTH OF THE BODY.
14

14 (15) THE FRONT END IS POINTED, THE SHAPE IS A BROAD OVOID. 5 GEN LEUCOPHRYS KS 324

15 (14) THE FRONT END IS BROADLY ROUNDED SO THE SHAPE IS A SLENDER OBOVOID.
6 GEN TURANIA KS 326

16 (13) THE MOUTH IS THREE QUARTERS TO FOUR FIFTHS THE LENGTH OF THE BODY. WITH ELONGATE TAIL CILIA.
7 GEN LEMBADION KS 326

17 (2) THE MOUTH OPENING IS ANTERIORLY TRUNCATED OR ROUNDED.
18

18 (23) THE MOUTH RUNS OBLIQUELY FROM FRONT RIGHT TO BACK LEFT WITH THE RIGHT EDGE HAVING A PROMINENT ECTOPLASMIC LIP.
19

19 (22) THREE CILIARY STRUCTURES (IN THE MOUTH?). THERE IS AN OUTER MEMBRANE TO THE LEFT, UNDER WHICH IS AN INNER ONE AND THERE IS A THREE ROWED CILIARY STRIP ON THE RIGHT SIDE OF THE FLOOR. 20

20 (21) THE MOUTH APPROACHES THE MIDDLE OF THE VENTRAL SIDE, THE DORSAL ROWS ARE NOT CLEARLY CURVED TO THE RIGHT ANTERIORLY.
8 GEN GLAUCOMA KS 328

21 (20) THE MOUTH LIES TO THE RIGHT EDGE OF THE VENTRAL SIDE, THE DORSAL ROWS (OF CILIA?) ARE MORE OR LESS SHARPLY BENT TO THE RIGHT ANTERIORLY.
9 GEN COLPIDIUM KS 333

22 (19) ONLY ONE STRONG MEMBRANE STARTING FROM THE LEFT EDGE AND BEATING AGAINST A HIGH CONCAVE ECTOPLASMIC LIP. VERY SMALL CONTRACTILE CELLS FROM MOSS AND SEA WATER. 11 GEN PSEUDOGLAUCOMA KS 335

23 (18) THE MOUTH OPENING IS TO THE RIGHT AND THERE IS NO ECTOPLASMIC LIP. 24

24 (29) MOUTH WITH TWO OR THREE MEMBRANES. 25

25 (26) MEMBRANES SURROUND AND FORM A POCKET AT THE BACK OF THE BUCCAL CAVITY WHICH IS NEAR THE FRONT END. VERY SMALL, PRODUCE A SHEATH OF MUCUS.
30 GEN CYRTOLOPHOSIS KS 353

26 (25) THE MOUTH DOES NOT HAVE A POCKET AND THE CELLS HAVE NO SHEATH. 27

27 (28) THERE IS A FREE MEMBRANELLE ON BOTH SIDES OF THE MOUTH. ROUNDED AT THE FRONT END.
15 GEN DICHILUM KS 338

28 (27) FREE MEMBRANELLE TO THE RIGHT, TWO FURTHER MEMBRANES IN THE INSUNKEN MOUTH DEPRESSION APPARENTLY FUSE POSTERIORLY TO FORM A POCKET. POINTED AT THE FRONT END. FROM MOSS.
10 GEN PARAGLAUCOMA KS 334

29 (24) MOUTH WITH ONLY A SINGLE MEMBRANE. 30

30 (31) THE MEMBRANE SPANS OVER THE FRONT AND LEFT OF THE MOUTH LIKE A CAP.
14 GEN STEGOCHILUM KS 337

31 (30) THE MEMBRANE DOES NOT FORM A CAP. 32

32 (35) MEMBRANE LIES IN THE MOUTH WHICH IS DRAWN OUT TOWARDS THE BACK IN A FUNNEL SHAPE. 33

33 (34) IMPOSING LONG OVOID CELLS, SLIGHTLY FLATTENED.
16 GEN MONOCHILUM KS 339

34 (33) SMALL FLATTENED KIDNEY SHAPED CELLS.
24 GEN CHASMATOSTOMA KS 347
23 GEN PLEUROCHILIDIUM KS 347

35 (32) MOUTH WITHOUT A FUNNEL EXTENSION. 36

36 (39) MOUTH LIES AT, OR VERY NEAR, THE FRONT POLE. 37

37 (38) THE MOUTH IS A DEEP INSUNKEN DEPRESSION IN THE TRUNCATED FRONT END. FOUND IN EGG JELLY.
13 GEN ESPEJOIA KS 336

38 (37) THE MOUTH IS A VERY NARROW SLIT IN THE VICINITY OF THE POLE. 12 GEN MALACOPHRYS KS 335

39 (36) MOUTH IS CLEARLY REMOVED FROM THE POLE. 40

40 (41) THERE IS A GROOVE WHICH IS DIFFICULT TO SEE RUNNING FROM THE POLE TO THE SMALL MOUTH. SPINDLE SHAPED.
17 GEN BIZONE KS 340

41 (40) THE MOUTH DOES NOT HAVE A PERISTOMIAL GROOVE. THE CELL IS SPINDLE SHAPED. THE MOUTH FORMS A NOTCH AT THE LEFT VENTRAL SIDE AND A MEMBRANELLE BEATS INWARDS FROM THE LEFT OF THIS.
18 GEN ARISTEROSTOMA KS 340

42 (1) THE BODY HAS ONE OR SEVERAL CAUDAL CILIA, THOSE IN UROCENTRUM BEING STUCK TOGETHER TO FORM A BRUSH-LIKE STRUCTURE. THE MOUTH IS SMALL, CELLS USUALLY VERY SMALL. 43

43 (46) CILIA IN ONE OR THREE GIRDLES. 44

44 (45) VERY SMALL CELLS (20 MICRONS) WITH ONLY ONE GIRDLE OF CILIA IN THE MIDDLE AND WITH A POSTERIOR CILIUM. 32 GEN UROZONA KS 355

45 (44) FAIRLY SMALL CELLS (UP TO 70 MICRONS) AND IN ADDITION TO AN ADORAL GIRDLE THERE IS BROAD CILIATED GIRDLE EITHER IN FRONT OR BEHIND. TAIL CILIA ARE NUMEROUS AND STUCK TOGETHER. 31 GEN UROCENTRUM KS 354

46 (43) CILIA ONLY IN LONGITUDINAL ROWS, NOT FORMING GIRDLES. 47

47 (64) MOUTH AT THE MIDDLE OR MOSTLY IN FRONT OF THE MIDDLE. 48

48 (49) BODY IS CLEARLY LATERALLY FLATTENED, A TYPE OF PERISTOMIAL GROOVE LEADS FROM THE FRONT POLE ALONG THE NARROW SIDE, HAVING A THIN MEMBRANE TO THE RIGHT AND DENSELY PACKED CILIA TO THE LEFT. THE MOUTH IS IN THE CENTRE OF A VERY CONVEX SURFACE AND DOES NOT FORM A DEPRESSION. SMALL OVAL AND MARINE. 25 GEN RHINODISCULUS KS 347

49 (48) THE BODY IS NOT STRONGLY LATERALLY FLATTENED. 50

50 (55) THE BODY IS WEAKLY LATERALLY FLATTENED, THE SHAPE IS A LONG ELLIPSOID. THE MOUTH IS IN A DEPRESSION WHICH IS IN FRONT OF THE MIDDLE ON THE SOMEWHAT CONCAVE VENTRAL SURFACE. 51

51 (52) THE FRONT POLE HAS AN UNCILIATED FRONTAL REGION. A GROOVE (DIFFICULT TO SEE) RUNS FROM THE FRONT END TO THE MOUTH AND THE RIGHT EDGE OF THIS IS SLIGHTLY MORE STRONGLY CILIATED.
33 GEN URONEMA KS 355

52 (51) THE FRONT POLE IS WITHOUT AN UNCILIATED REGION. THERE IS NO PERISTOMIAL GROOVE. 53

53 (54) THE MEMBRANES OF THE ORAL CAVITY DO NOT FORM A POSTERIOR POCKET. THE CONTRACTILE VACUOLE IS TERMINAL. 28 GEN DEXIOTRICHIDES KS 351

54 (53) THE TWO MEMBRANES OF THE ORAL DEPRESSION MAKE A POCKET WHICH IS COMPLETE POSTERIORLY. THE CONTRACTILE VACUOLE IS VENTRAL AND CLEARLY REMOVED FROM THE POLE.
29 GEN URONEMOPSIS KS 353

55 (50) THE BODY IS FLATTENED DORSO-VENTRALLY TO A GREATER OR LESSER EXTENT. 56

56 (59) THE BODY IS CLEARLY FLATTENED, THE MOUTH APPROACHES THE RIGHT EDGE. THE SHAPE IS A SHORT OVAL TO OVOID. 57

57 (58) THE MOUTH IS ENCLOSED POSTERIORLY BY TWO PERIPHERAL MEMBRANES TO FORM A KIND OF POCKET, OR HAS A SINGLE POCKET-LIKE MEMBRANE AT THE RIGHT EDGE.
26 GEN SAPROPHILUS KS 347

58 (57) THE MOUTH IS SMALL AND KIDNEY SHAPED, WITH A MEMBRANE ON THE (CONCAVE) LEFT SIDE.
22 GEN PLATYNEMA KS 345

59 (56) THE BODY IS JUST PERCEPTIBLY FLATTENED, A LONG ELLIPSE OR OVAL. 60

60 (61) THE BODY HAS PEG-LIKE STRUCTURES AT THE FRONT AND BACK. 21 GEN BALANONEMA KS 345

61 (60) THE BODY ENDS WITHOUT PEG-LIKE STRUCTURES. 62

62 (63) THE BODY IS A PLUMP WORM-LIKE SHAPE AND PLIABLE. THE BACK END HAS 4-5 INDISTINCT TERMINAL CILIA. THE MOUTH IS SMALL AND HEART SHAPED IN A DEPRESSION IN THE FIRST FIFTH OR SIXTH OF THE BODY. MARINE.
19 GEN CARDIOSTOMA KS 341

63 (62) THE BODY IS A LONG ELLIPSE OR OVAL, NOT FLEXIBLE NOR WORM-LIKE. THE FRONT END USUALLY HAS AN UNCILIATED REGION. CILIA STICK OUT IN MORE OR LESS OBLIQUE ROWS. THE EDGE OF THE BODY IS SERRATED TO A GREATER OR LESSER EXTENT. THE MOUTH IS A SMALL HALF-MOON SHAPE, WITH AN OUTER MEMBRANE ON THE STRAIGHT LEFT EDGE BELOW WHICH IS AN INNER MEMBRANELLE LEADING FROM FRONT RIGHT TO BACK LEFT. MOUTH USUALLY HAS AN ANTERIOR CILIARY ROW TO THE RIGHT. 20 GEN LOXOCEPHALUS KS 341

64 (47) THE MOUTH IS BEHIND THE MIDDLE OF THE BODY.
65

65 (66) THE BODY IS A BROADENED OVAL, VENTRALLY FLAT AND CILIATED, DORSALLY NAKED AND SLIGHTLY ARCHED.
27 GEN CINETOCHILUM KS 350

66 (65) THE BODY IS A SLIM TO PLUMP SPINDLE SHAPE, NOT PERCEPTIBLY FLATTENED VENTRALLY, COMPLETELY CILIATED. 67

67 (68) VERY SMALL MARINE FORMS WITH A CEASELESS AGITATED (DANCING) MOTION.
35 GEN UROPEDALIUM KS 359

68 (67) VERY SMALL FORMS FROM MOSS HAVING A JERKY MOTION WITH PAUSES. 34 GEN HOMALOGASTRA KS 358

GENERA OF PHILASTERIDAE KS 364

(THE MARINE ANOPHRYS SARCOPHAGA COHN IS ADDED HERE, WHERE IT PROBABLY BELONGS).

1 (6) PERISTOME WITH LONGITUDINAL ROWS OF CILIA AND A SMALL PREORAL MEMBRANE. ECTOPLASM PLIABLE BUT OPTICALLY DENSE, WITH TRICHOCYSTS. ALWAYS ONE CAUDAL CILIUM. 2

2 (5) NUCLEUS OVAL, THERE IS AN INSUNKEN POCKET TO THE RIGHT OF THE OPENING OF THE MOUTH, IT LIES UNDER THE ECTOPLASM AND HAS A SMALL TRIANGULAR MEMBRANE. 3

3 (4) LARGE MARINE CELLS WITH A TERMINAL CONTRACTILE VACUOLE. 1 GEN PHILASTER KS 364

4 (3) SMALL FRESHWATER CELLS, HAVING THE CONTRACTILE VACUOLE NEAR THE MIDDLE. 2 GEN PHILASTERIDES KS 366

5 (2) THE HIND PART OF THE INVAGINATED POCKET OF THE PERISTOME FORMS A SPIRAL AROUND THE MOUTH GIVING THE MOUTH A CHARACTERISTIC APPEARANCE. THE NUCLEUS IS ALMOST ALWAYS DRAWN OUT BUT MAY OCCASIONALLY TAKE THE FORM OF AN OVOID. 3 GEN HELICOSTOMA KS 366

6 (1) PERISTOME WITH CILIA ONLY ON THE RIGHT EDGE. THE ECTOPLASM IS BRIGHT AND SLIGHTLY SCALEY. SELDOM WITH TRICHOCYSTS. TO THE RIGHT OF THE EDGE OF THE MOUTH IS A MULTILAYERED THICK MEMBRANE AND TO THE RIGHT OF THE CYTOSTOME IS AN ECTOPLASMIC POCKET WHICH HAS A SPECIAL SMALL POINTED MEMBRANE. 4 GEN LEMBOIDES KS 368

GENERA OF PLEURONEMATIDAE KS 374

1 (2) SMALL FRESHWATER FORMS WITH A TEST.
4 GEN CALYPTOTRICHA KS 387

2 (1) NOT WITH A TEST. 3

3 (4) MARINE, ECTOCOMMENSAL ON HYDRACTINIAS.
7 GEN PLEUROCOPTES KS 391

4 (3) NOT ECTOCOMMENSAL ON ACTINIAS. 5

5 (6) UNDULATING MEMBRANE NOT FORMING A CLEAR POCKET AROUND THE MOUTH. THE PERISTOME RUNS OBLIQUELY FROM THE FRONT RIGHT TO THE HIND LEFT.
3 GEN CTEDOCTEMA KS 386

6 (5) THE PERISTOME HAS A DISTINCT MEMBRANOUS POCKET WHICH RARELY LIES OBLIQUELY. 7

7 (8) PERISTOME LIES CLEARLY AT THE BROADER SIDE AND EXTENDS BACKWARDS AS A CLEAR GROOVE RUNNING TOWARDS THE HIND END. THE BODY IS ALWAYS FLATTENED.
2 GEN CRISTIGERA KS 382

8 (7) PERISTOME HAS NO CLEAR GROOVE-LIKE EXTENSION, SITUATED AT THE NARROWER RIGHT EDGE OR NEAR THE RIGHT SIDE OF THE BODY. 9

9 (12) LARGISH, 70-180 MICRONS. 10

10 (11) A LONG SENSORY CILIA ONLY AT OR NEAR THE HIND END AT MOST. ONE CONTRACTILE VACUOLE, THE PERISTOME BEGINS NEAR THE FRONT END AND TAKES ON A SEMI-CIRCULAR SHAPE BULGING TO THE LEFT NEAR THE MOUTH.
5 GEN PLEURONEMA KS 387

11 (10) OVER ALL THE BODY AND AMONG THE BODY CILIA ARE THE SENSORY CILIA BEING TWO TO THREE TIMES LONGER THAN THE BODY CILIA. THE PERISTOME BEGINS IN THE FIRST QUARTER, THERE IS NO POSTERIOR POCKET. MANY CONTRACTILE VACUOLES.
6 GEN HISTIOBALANTIUM KS 390

12 (9) SMALL FORMS, SELDOM MORE THAN 50 MICRONS, WITHOUT THE PERISTOME FORMING A SEMICIRCULAR POCKET.

1 GEN CYCLIDIUM KS 375

GENERA OF ANCISTRUMIDAE INCL. SUBFAM HEMISPEIRINAE KS 392

1 (6) THE CILIARY ROWS RUN ALONG THE BODY (MERIDIONAL) OR ARE SLIGHTLY SPIRAL.
SUBFAM ANCISTRUMINAE KS 392 2

2 (3) THE PERISTOME IS MERIDIONAL ON THE FLATTENED VENTRAL SIDE. TO THE LEFT OF IT IS A BROAD REGION FREE OF CILIA. 1 GEN ANCISTRUMA KS 392

3 (2) THE PERISTOME FORMS A SPIRAL, OR TERMINAL AND RUNNING TRANSVERSELY. 4

4 (5) THE PERISTOME SPIRALS FROM THE MIDDLE OF THE BODY TO THE MOUTH.
2 GEN PLAGIOSPIRA KS 395

5 (4) THE PERISTOME IS A TRANSVERSE SPIRAL RUNNING AROUND THE TRUNCATED POSTERIOR PART.
3 GEN BOVERIA KS 395

6 (1) CILIARY ROWS RUN TRANSVERSELY OR ARE ABSENT EXCEPT FOR A THIGMOTACTIC FIELD AT THE FRONT END.
SUBFAM HEMISPEIRINAE KS 396 P 41

SUBFAMILY HEMISPEIRINAE KS 398

1 (2) THE BODY IS CILIATED, ONLY 1 ADORAL MEMBRANE.
1 GEN HEMISPEIRA KS 398

2 (1) BODY NOT CILIATED, WITH A DOUBLE ADORAL MEMBRANE. 2 GEN HEMISPEIROPSIS KS 398

SUBORDERS OF SPIROTRICHA KS 401

1 (6) CILIATURE USUALLY OF FREE CILIA ONLY AND ONLY RARELY WITH SMALL GROUPS OF CIRRI OCCURRING TOGETHER WITH FREE CILIA. 2

2 (3) THE BODY IS EVENLY CILIATED, ONE FAMILY IS FLATTENED AND THE DORSAL SIDE IS SPARSELY OR NOT CILIATED. IN THE ECTOCOMMENSAL FAMILY LICNOPHORIDAE THE CILIATURE IS LIMITED TO WREATHS AROUND A DISC. THE PERISTOME IS MOSTLY WELL DEVELOPED. WHERE THE AZM FORMS AN ALMOST CLOSED SPIRAL IT ENCLOSES A WELL CILIATED PERISTOMIAL REGION.
1 SUBORD HETEROTRICHA KS 401 P 43

3 (2) BODY CILIATURE REDUCED OR ABSENT. 4

4 (5) SMALL LATERALLY FLATTENED CELLS WITH A STIFF PELLICLE. THE PERISTOME IS REDUCED, HAVING 8 MEMBRANELLES LYING IN A DEPRESSION WHICH OPENS VENTRALLY. 3 SUBORDER CTENOSTOMATA KS 518 P 57

5 (4) INFUSORIA ROUND IN CROSS SECTION, GENERALLY WITH A FAIRLY REDUCED CILIATURE. THE ADORAL ZONE ENCIRCLES A NONCILIATED ANTERIOR PERISTOMIAL FIELD. IT FORMS A FAIRLY OR COMPLETELY CLOSED SPIRAL WHICH IS USED FOR FEEDING AND LOCOMOTION.
2 SUBORD OLIGOTRICHA KS 487 P 54

6 (1) VENTRAL CILIATURE LIMITED TO CIRRI, DORSALLY THERE ARE ROWS OF SHORT, DELICATE AND SLIGHTLY MOTILE BRISTLES. 4 SUBORD HYPOTRICHA KS 532 P 60

FAMILIES OF HETEROTRICHA KS 402

1 (14) BODY COMPLETELY AND UNIFORMLY CILIATED.
2

2 (13) THE PERISTOME ALMOST COMPLETELY OPEN AND LEADS INTO A SHORT NARROW ORAL FUNNEL. IT IS COMPLETELY ABSENT IN ONE FAMILY. 3

3 (8) THE PERISTOME HAS A MEMBRANELLAR ZONE AND TO ITS RIGHT IS A NARROW CILIA-FREE ZONE. USUALLY THERE IS AN UNDULATING MEMBRANE OR A SIMILAR CILIARY STRUCTURE IN FRONT OF AND TO THE RIGHT OF THE CYTOSTOME. THERE MAY BE A SMALL AND INDISTINCT PERISTOMIAL FIELD BETWEEN THIS STRUCTURE AND THE ADORAL ZONE OF MEMBRANELLES. 4

4 (5) ON THE VENTRAL SIDE THE ADORAL ZONE OF MEMBRANELLES IS PULLED OBLIQUELY TO THE RIGHT POSTERIORLY. TO THE RIGHT OF THIS IS A ZONE FREE OF CILIA, AND, IN MOST SPECIES, TO THE RIGHT OF THAT, THERE IS AN UNDULATING MEMBRANE IN FRONT OF THE MOUTH. MANY OF THE MORE DEVELOPED FORMS HAVE A LENGTHENED ZONE (AZM) DRAWN AROUND THE BODY IN A SPIRAL.
1 FAM METOPIDAE KS 403 P 45

5 (4) THE UPPER PART OF THE ADORAL ZONE OF MEMBRANELLES RUNS ALONG THE LONG AXIS OF THE FLATTENED VENTRAL SIDE AND TURNS SLIGHTLY TO THE RIGHT BEFORE THE MOUTH OPENING. 6

6 (7) THERE IS NO ORAL FUNNEL, AND THE MOUTH OPENS AS A SLIT NEAR THE (ADORAL) ZONE (OF MEMBRANELLES), BUT IT IS USUALLY FIRMLY CLOSED AND IT IS DIFFICULT TO SEE. THERE IS NO UNDULATING MEMBRANE.
2 FAM REICHENOWELLIDAE KS 434 P 47

7 (6) THE ORAL FUNNEL IS USUALLY VISIBLE AND TYPICALLY, IN MOST GENERA, THE UNDULATING MEMBRANE OR A DOUBLE CILIARY ROW STANDS IN FRONT OF THE MOUTH BESIDE AND AT THE EDGE OF THE (UNCILIATED?) STRIPE.
3 FAM SPIROSTOMIDAE KS 436 P 48

8 (3) THERE IS A LARGE PERISTOMIAL FIELD IN THE FORM OF A HALF OR COMPLETE SPIRAL DELIMITED BY THE (ADORAL) ZONE (OF MEMBRANELLES). 9

9 (10) THE PERISTOMIAL FIELD IS NOT CILIATED AND THERE IS A LARGE UNDULATING MEMBRANE TO ITS RIGHT.
4 FAM CONDYLOSTOMIDAE KS 452

10 (9) THE PERISTOMIAL FIELD IS CILIATED AND THERE IS NO UNDULATING MEMBRANE. 11

11 (12) THE PERISTOMIAL FIELD IS NOT DRAWN OUT INTO TWO EXTENSIONS. THE INFUSORIA MAY OR MAY NOT LIVE IN THICK-WALLED GELATINOUS TESTS.
5 FAM STENTORIDAE KS 457 P 50

12 (11) THE PERISTOMIAL FIELD IS PULLED OUT INTO TWO WINGS. THESE CILIATES FORM A FLASK-SHAPED, THIN-WALLED, PSEUDOCHITINOUS TEST.
6 FAM FOLLICULINIDAE KS 466 P 51

13 (2) THE PERISTOME LIES IN AN ANTERIOR FUNNEL-SHAPED DEPRESSION SO THAT THE GREATER PART IS COVERED OVER. 7 FAM BURSARIIDAE KS 476 P 52

14 (1) THE NORMAL CILIATURE IS EITHER RESTRICTED TO THE VENTRAL SIDE OR IS COMPLETELY MISSING. 15

15 (16) FREE-LIVING FLATTENED MARINE FORMS WITH CILIA ONLY ON THE VENTRAL SIDE. THE ADORAL ZONE OF MEMBRANELLES IS PULLED AROUND THE FRONT OF THE FLATTENED VENTRAL SURFACE, AND THE MOUTH LIES NEAR THE MID-LINE OF THIS SURFACE ON THE LEFT SIDE.
8 FAM PERITROMIDAE KS 481 P 53

16 (15) ENDOCOMMENSAL MARINE FORMS; WITH BOTH ENDS FORMING DISCS, AND THE MIDDLE REGION COMPRESSED TO FORM A NECK. THE FRONT DISC FORMS A COMPLETELY CLOSED SPIRAL, AND THE HIND DISC HAS SEVERAL MEMBRANOUS CILIARY WREATHS AT ITS MARGIN.
9 FAM LICNOPHORIDAE KS 484

GENERA OF METOPIDAE KS 403

1 (6) BODY CILIATURE EVEN (SEE NOTE). 2

2 (5) ECTOPLASM SOFT AND PLIABLE. 3

3 (4) OVAL TO OBOVOID MOSS FORMS, CONTRACTILE VACUOLE IN SECOND THIRD OF THE BODY. COVERED VENTRALLY WITH RECESSED GROOVES. THE RIGHT EDGE HAS NOTICEABLE FOLD BUT NO MARGINAL ZONE (OF CILIA?) NOR UNDULATING MEMBRANE. 5 GEN BRYOMETOPUS KS 433

4 (3) DIFFERENT IN FORM, NOT FROM MOSS. CONTRACTILE VACUOLE TERMINAL. PERISTOME TYPICAL.
1 GEN METOPUS KS 404 P 46

5 (2) STIFF ECTOPLASM WITH SCALE-LIKE STRUCTURE, SPIRALLY GROOVED. 2 GEN TROPIDOTRACTUS KS 428

6 (1) BODY CILIATURE REDUCED. 7

7 (10) CILIATURE OF THE "DOME" LIMITED TO DORSAL CIRRI AND TO THE MARGINAL ZONE. 8

8 (9) ONE OR TWO ROWS OF DORSAL CIRRI.
3 GEN CAENOMORPHA KS 429

9 (8) 2 SEPARATE LONG CIRRI.
4 GEN LUDIO KS 433

10 (7) THE CILIATURE OF THE "DOME" IS LIMITED TO THE RIGHT EDGE AND A FRONTAL TUFT OF ABOUT 8 ADHERING CILIA. SUBGEN TROCHELLA KS 427

NOTE : THERE IS A SMALL TYPE WITH ABNORMALLY LONG PERIPHERAL CILIA OF A SOMEWHAT DUBIOUS STATUS.
GEN PALMARIUM KS 428

THE SIX GROUPS OF METOPUS ACCORDING TO K's WORK OF 1927 KS 405

1 (6) ELONGATED FORMS. 7

2 (5) AZM NOT TWISTED, BEGINS AND RUNS OBLIQUELY ON VENTRAL SURFACE ONLY. 3

3 (4) THE FRONT OF THE BODY IS TRUNCATED AND IS NOT FLATTENED TO FORM A HYALINE PLATE, BUT MOSTLY ARCHED INTO A DOME SHAPE.
GROUP I KS 405

4 (3) ANTERIORLY THERE IS A CLEAR FLATTENED PLATE WHICH LIES TO THE RIGHT OF, OR IN FRONT OF, THE PERISTOME. GROUP II KS 408

5 (2) THE ADORAL ZONE OF MEMBRANELLES BEGINS AT THE FRONT LEFT SIDE OR SOMEWHAT DORSALLY.
GROUP III KS 413

6 (1) PEAR OR BELL SHAPED. 7

7 (8) THE ECTOPLASM IS CLEAR, THE ADORAL ZONE OF MEMBRANELLES REDUCED TO THE LAST 7-8 MEMBRANELLES.
GROUP V KS 422

8 (7) THE ECTOPLASM IS OPAQUE AND THERE IS NO REDUCTION OF THE ADORAL ZONE OF MEMBRANELLES. 9

9 (10) THE PERISTOME ENDS BEHIND THE MIDDLE, VENTRALLY, AND NEAR THE RIGHT EDGE OF THE BODY. THE BUCCAL CAVITY LIES LENGTHWISE.
GROUP IV KS 420

10 (9) THE PERISTOME DESCRIBES A FULL SPIRAL AND ENDS ON THE DORSAL SIDE IN A TRANSVERSE DIRECTION.
GROUP VI KS 423

THE OLD SEVENTH GROUP HAS BEEN UNITED WITH THE SIXTH.

GENERA OF REICHENOWELLIDAE KS 435

1 (2) ELONGATE FORMS FROM STAGNANT FRESHWATER POOLS, CONTRACTILE VACUOLE IS TERMINAL AND THERE ARE MERIDIONAL STRIPES.

1 GEN REICHENOWELLA KS 435

2 (1) OVAL FORMS FROM MOSS WITH SEVERAL CONTRACTILE VACUOLES. STRIPES FROM THE BROADER RIGHT SIDE PASS BEHIND THE MOUTH AND SPIRAL OBLIQUELY OVER THE LEFT SIDE.

2 GEN BALANTIDIOIDES KS 435

GENERA OF SPIROSTOMIDAE KS 436

1	(12)	THERE IS NO UNDULATING MEMBRANE IN FRONT OF THE MOUTH. 2
2	(5)	WORMLIKE, AND CLEARLY CONTRACTILE. 3
3	(4)	MOSTLY FRESHWATER FORMS WHICH BECOME TWISTED WHEN THEY CONTRACT. 1 GEN SPIROSTOMUM KS 437
4	(3)	ONLY MARINE, WITH TAILS. CONTRACTION DOES NOT CAUSE TWISTING. 2 GEN GRUBERIA KS 440
5	(2)	NOT CLEARLY CONTRACTILE. 6
6	(7)	ELONGATED FRESHWATER FORMS. NO UNDULATING MEMBRANE AT THE RIGHT PREORAL EDGE OF THE PERISTOME, RATHER A DOUBLE ROW OF CILIA IN A GROOVE. 3 GEN PSEUDOBLEPHARISMA KS 442
7	(6)	NOT ELONGATED FRESHWATER FORMS. 8
8	(9)	STRONGLY RIBBED OVAL FORMS FROM MOSS. 7 GEN PHACODINIUM KS 450
9	(8)	SMALL OVAL MARINE CELLS, NOT CLEARLY RIBBED. 10
10	(11)	THE ADORAL ZONE OF MEMBRANELLES IS COILED INTO A SPIRAL IN FRONT OF THE MOUTH. 6 GEN SPIROSTOMINA KS 449
11	(10)	THE ADORAL ZONE OF MEMBRANELLES STOPS DIRECTLY AT THE MOUTH. 5 GEN PROTOCRUCIA KS 448
12	(1)	THERE IS AN UNDULATING MEMBRANE ALONG THE RIGHT EDGE IN FRONT OF THE MOUTH. 13

13 (14) The peristome does not usually have a narrowed region, but if so, there is no gelatinous surface coat.
4 gen BLEPHARISMA KS 442

14 (13) The peristome tapers like a neck or may be pointed. The ectoplasm is covered with a gelatinous layer. Associated with this are symbiotic bacteria, adhering by one end or stuck along their length. Marine.
8 gen PARABLEPHARISMA KS 450

GENERA OF STENTORIDAE KS 459

1 (4) THE RIGHT EDGE OF THE PERISTOME CLEARLY MEETS THE BEGINNING OF THE ADORAL ZONE OF MEMBRANELLES AT AN ANGLE. THE MEMBRANELLES DO NOT FORM A CLOSED CIRCLE. NOT CONTRACTILE, BAG-SHAPED. 2

2 (3) THE RIGHT SIDE OF THE PERISTOME IS PULLED OVER TO THE VENTRAL SIDE OF THE ANIMAL AND (ANTERIORLY) ABOUT HALF OF THE VENTRAL SURFACE LIES TO THE RIGHT OF THE PERISTOME.

1 GEN CLIMACOSTOMUM KS 459

3 (2) THE RIGHT EDGE OF THE PERISTOME IS PULLED ALONG THE NARROW RIGHT EDGE OF THE BODY, SO THAT NO PART OF THE VENTRAL SURFACE IS VISIBLE TO THE RIGHT OF THE PERISTOME.

2 GEN FABREA KS 461

4 (1) THE ADORAL ZONE OF MEMBRANELLES LIES NEAR THE FLATTENED FRONTAL REGION AND FORMS AN ALMOST COMPLETE CIRCLE. THE BODY IS VERY CONTRACTILE AND THE CELL IS SPHERICAL TO TRUMPET SHAPED.

3 GEN STENTOR KS 461

GENERA OF FOLLICULINIDAE KS 469

1 (8) THERE IS NO EXPANSION OF THE NECK REGION OF THE TEST. 2

2 (3) THERE ARE SAC-LIKE EVAGINATIONS FROM THE HIND END OR FROM THE SIDE OF THE TEST.
4 GEN MIROFOLLICULINA KS 474

3 (2) THE TEST DOES NOT HAVE EVAGINATIONS. 4

4 (5) THE TEST HAS A BROAD ATTACHMENT SURFACE, THE NECK BEING OBLIQUE OR PERPENDICULAR.
1 GEN FOLLICULINA KS 469

5 (4) THE HOUSE IS ATTACHED BY THE HIND END AND STANDS MORE OR LESS UPRIGHT FROM THE BASE. 6

6 (7) THE TEST IS SLIM AND HAS NO FURROWS AROUND THE MIDDLE
(A) FASTENED ON A LONG CYLINDRICAL STALK
3 GEN PSEUDOFOLLICULINA KS 473
(B) NO STALK
2 GEN METAFOLLICULINA KS 473

7 (6) THE TEST IS PLUMP AND HAS TRANSVERSE FURROWS AROUND THE MIDDLE. THERE IS NO STALK BUT THERE MAY BE A SHORT TERMINAL PEG-LIKE STRUCTURE OR BLEB. THE NECK REGION IS RECOGNIZABLE ONLY AS A SHORT COLLAR.
6 GEN PEBRILLA KS 475

8 (1) THE NECK REGION HAS A BASAL BULGE. THE TEST IS FIXED AT THE END OR AT THE SIDE.
5 GEN PARAFOLLICULINA KS 474

GENERA OF BURSARIIDAE KS 476

1 (4) THE PERISTOMIAL FUNNEL CURVES, TO THE LEFT AT ITS POSTERIOR END. 2

2 (3) VERY LARGE AND PLUMP ANIMALS WHICH ARE DIVIDED INTO TWO PARTS LENGTHWISE, BY THE PERISTOMIAL SPACE.
1 GEN BURSARIA KS 476

3 (2) SMALL OR MEDIUM SIZED ANIMALS WITH A SIMPLE PERISTOME.
2 GEN THYLACIDIUM KS 479

4 (1) THE PERISTOME RETAINS ITS NORMAL RIGHT CURVATURE AT ITS POSTERIOR END.
3 GEN BURSARIDIUM KS 479

GENERA OF PERITROMIDAE KS 481

1 (2) THE NORMAL CILIARY ROWS ABUT AGAINST THE ADORAL ZONE OF MEMBRANELLES WITHOUT FORMING A PERISTOMIAL FIELD. THE MEMBRANELLES FORM A SEMI-CIRCLE AROUND THE FRONT HALF OF THE VENTRAL SURFACE. THE VENTRAL SIDE IS FLAT.

1 GEN PERITROMUS KS 481

2 (1) THERE IS A PERISTOMIAL FIELD TO THE RIGHT OF THE PREORAL PART OF THE ADORAL ZONE OF MEMBRANELLES IN WHICH THE CILIARY ROWS OF THE FIELD RUN RADIALLY TO THE MOUTH. THE BODY IS CURVED DORSALLY.

2 GEN PEDIOSTOMUM KS 483

(CLIMACOSTOMUM DIEDRUM FF)

FAMILIES OF OLIGOTRICHA KS 488

1 (2) THE ORAL REGION OF THE PERISTOME IS UNCOVERED ON THE VENTRAL SIDE.
1 FAM HALTERIIDAE KS 488 P 55

2 (1) THE ADORAL ZONE OF MEMBRANELLES ENCLOSES THE FRONTAL PERISTOMIAL FIELD IN A COMPLETE SPIRAL WREATH, WITH THE ORAL REGION LYING WITHIN THE WREATH. 3

3 (4) THE ANIMALS DO NOT PRODUCE TESTS.
2 FAM STROBILIDIIDAE KS 508

4 (3) THE ANIMALS USUALLY HAVE A SOLID TEST.
3 FAM TINTINNIDAE KS 513 P 56

GENERA OF HALTERIIDAE KS 488

1 (8) THE HIND END OF THE BODY DOES NOT HAVE A THICK TRAILING PLASMATIC EXTENSION, AT MOST THERE MAY BE A SHORT SPIKE. 2

2 (3) THE BODY IS VERY CONTRACTILE, STENTOR-SHAPED, HAS NORMAL CILIATION AND WITHOUT A DIFFERENTIATED PREORAL ZONE.
VERY DUBIOUS GEN MESERES KS 488

3 (2) THE BODY IS NOT MARKEDLY CONTRACTILE. 4

4 (5) THE BODY HAS AN EQUATORIAL WREATH OF LONG BRISTLES OR CIRRI. 4 GEN HALTERIA KS 504

5 (4) BODY WITHOUT AN EQUATORIAL WREATH. 6

6 (7) THE ADORAL ZONE OF MEMBRANELLES HAS A CLEARLY DIFFERENTIATED PREORAL SECTION. THE FRONTAL PART ENCIRCLES A DISTINCT APICAL COLLAR.
2 GEN STROMBIDIUM KS 489

AFTER FIXING PLANKTONIC MATERIAL THIS REGION MAY BE POORLY SHOWN, IF AT ALL. THEY ARE DEALT WITH LATER. (KS 500)

7 (6) THE ZONE HAS NO SPECIAL PREORAL REGION. SPHERICAL MARINE CELLS.
3 GEN METASTROMBIDIUM KS 504

8 (1) THE BODY HAS A LONG THICK AND CONTRACTILE PLASMATIC EXTENSION AT THE HIND END.
5 GEN TONTONIA KS 505

GENERA OF FRESHWATER TINTINNIDAE KS 514

1 (4) The test is gelatinous or thin walled (mucus-like); often containing adhering foreign bodies (algae/ detritus). Coloured by methylene blue (Entz Jr.). The test is particularly delicate in the first genus, easily discarded or perhaps never formed.
2

2 (3) The cell body has rows of relatively distinct cilia. The test is very delicate and is often apparently lacking (not visible).
1 gen STROMBIDINOPSIS KS 515

3 (2) The cell body has only one ciliated region which lies behind the peristome. The test is always obvious. 2 gen TINTINNIDIUM KS 516

4 (1) The test is more solid and is not coloured with methylene blue. May have adhering irregular or foreign bodies. 5

5 (6) The test is cylindrical, without a distinct neck.
3 gen TINTINNOPSIS KS 516

6 (5) The test has a distinct neck.
4 gen CODONELLA KS 517

FAMILIES OF CTENOSTOMATA KS 520

1 (2) With four ciliary rows on the left posterior part of the pellicular 'plate' and at least two on the right. There is always a further row of cilia on the left near the front edge.

1 fam EPALCIDAE KS 520 P 58

2 (1) The front row of cilia on the left is absent. The hind rows on the right are totally absent. Cilia on the left may be reduced to a few groups; they are long and mostly glued together like cirri.

3

3 (4) The ciliary band is long and extends over both broad sides.

3 fam DISCOMORPHIDAE KS 531

4 (3) The ciliary band is short extending equally on both sides but only a little way from the ventral surface.

2 fam MYELOSTOMIDAE KS 529 P 59

GENERA OF EPALCIDAE KS 521

1 (4) THE POSTERIOR REGION OF THE 'PLATE' ON THE RIGHT SIDE ONLY HAS ONE DORSAL AND ONE VENTRAL ROW (OF CILIA?). THERE ARE USUALLY FOUR RIDGES TO THE RIGHT (SOMETIMES 2 OR 3), BUT MORE OFTEN RECOGNISABLE ONLY AT THE BORDERS AS FURROWS.
2

2 (3) WITH AT LEAST SOME POSTERIOR POINTS (LEFT AND RIGHT) BEARING PROMINENT SPINES.
2 GEN SAPRODINIUM KS 525

3 (2) THE POSTERIOR POINTS ARE TOTALLY WITHOUT SPINES.
1 GEN EPALXIS KS 521

4 (1) THE RIGHT 'PLATE' STILL HAS TWO CENTRAL ROWS OF CILIA. THE MIDDLE RIDGES OF THE RIGHT SIDE ARE FUSED INTO A UNIT SO THAT THERE ARE ONLY THREE ALTOGETHER.
3 GEN PELODINIUM KS 527

GENERA OF MYLESTOMIDAE KS 529

1 (2) THE HIND END HAS TWO LARGE CLEFTS ON THE RIGHT AND ONE ON THE LEFT.

1 GEN ATOPODINIUM KS 529

2 (1) THE HIND END IS WITHOUT CLEFTS ON EITHER SIDE, OR WITH ONE SMALL CLEFT ON THE RIGHT AND NONE ON THE LEFT.

2 GEN MYLESTOMA KS 530

FAMILIES OF HYPOTRICHA KS 537

1 (4) THE ADORAL ZONE OF MEMBRANELLES IS WELL DEVELOPED, DORSAL BRISTLES ARE PRESENT. 2

2 (3) THE DISPOSITION OF THE CIRRI IS PRIMITIVE, ALWAYS WITH TWO COMPLETE ROWS (USUALLY RECOGNISED AS THE MARINGAL ROWS), AND WITH THE VENTRAL ROWS REDUCED TO A GREATER OR LESSER EXTENT. DORSAL CIRRI ARE PRESENT.

2 FAM OXYTRICHIDAE KS 537 P 61

3 (2) THE CIRRI TEND TO BE IN GROUPS. THE MARGINAL AND VENTRAL ROWS ARE NO LONGER RECOGNISABLE AS SUCH. (IN CERTESIA THE LEFT MARGINAL ROW IS PRESENT). DORSAL BRISTLES ARE PRESENT.

2 FAM EUPLOTIDAE KS 621 P 71

4 (1) THE ADORAL ZONE OF MEMBRANELLES IS A SMALL, REDUCED PREORAL STRUCTURE. TO THE FRONT AT THE LEFT ARE THE REMAINS OF CIRRAL-LIKE MEMBRANELLES BUT THIS IS DIFFICULT TO SEE. THE CIRRI ARE USUALLY DIVIDED INTO TWO GROUPS DISTINCT IN FORM AND POSITION. THE FRONTO-VENTRAL GROUP USUALLY HAVE 7 CIRRI; AND THE TRANSVERSE GROUP PRIMITIVELY HAVING 5 CIRRI. THERE ARE NO DORSAL BRISTLES.

3 FAM ASPIDISCIDAE KS 643

GENERA OF OXYTRICHIDAE KS 538

1 (24) There are no transverse cirri but this may be difficult to ascertain. 2

2 (17) The ventral and marginal rows not lying in distinct spirals. 3

3 (4) Bodies are long and ribbon-like, sharply pointed or rounded and found in very saline media. With two splayed frontal membranelles (c.f. Strongylidium packi S 554).

1 gen CLADOTRICHA KS 540

4 (3) Otherwise. 5

5 (14) Frontal cirri not reduced to 3-6 isolated and strengthened ones, but numerous and in rows; or not distinct from the ventral cirri. 6

6 (7) Small oval (50-100 microns) ciliates with long 'flabby' brush-like cirri. Frontal cirri not differentiated. Freshwater.

2 gen PSILOTRICHA KS 541

7 (6) Long oval to long elliptical forms, with numerous frontal cirri in rows and also with densely packed ventral rows. 8

8 (9) The frontal rows lie obliquely (rising to the right) on the frontal field.

3 gen ECHANEUSTYLA KS 541

9 (8) The frontal rows lie in curves to the left at the front around the peristome. At least one row lies parallel to the front of the body. 10

10 (13) Only two ventral rows. 11

11 (12) Marine cells tapering at the back (?). Both ventral rows extend without interruption over the frontal field.

4 gen UROLEPTOPSIS KS 543

12 (11) Freshwater and moss forms, being broad at the back. One long wreath (of cirri) near the front edge. Two more rows lie almost lengthwise on the frontal field.

6 gen PARAHOLOSTICHA KS 545

13 (10) Numerous ventral rows. On the frontal field, two (sometimes more) rows (of cirri) are pulled out as curves parallel to the right front edge. From freshwater. Compare with the marine Urostyla gracilis and concha. KS 564

5 gen HEMICYCLIOSTYLA KS 544

14 (5) There are three clearly strengthened cirri which stand in the frontal field near the front edge, and behind these there may or may not be a few weaker cirri. 15

15 (16) Elongate shape; mostly with the hind end clearly tapering or tail-like. Usually with two ventral rows, but forms without ventral rows, or 3 or 4, may be included; but they might be placed in a separate group at a later date. Our present knowledge of them is not extensive.

8 gen UROLEPTUS KS 547

16 (15) Slender oval to ovoid shape with 5-8 rows or long or thin ventral cirri which are not well differentiated from the marginal rows.

7 gen KAHLIA KS 546

17 (2) THE VENTRAL AND MARGINAL ROWS RUN IN A PRONOUNCED LEFT-HAND SPIRAL AROUND THE BODY SO THAT DORSALLY SOME OF THESE ALWAYS CROSS OVER IN THE HIND REGION. 18

18 (19) PLUMP PLANKTONIC FRESHWATER CELLS WITH A BROAD PERISTOMIAL FIELD. THE BACK END HAS A SHORT SPINE. 10 GEN HYPOTRICHIDIUM KS 555

19 (18) SLENDER FORMS WITH A NARROW PERISTOME. 20

20 (21) THE PERISTOME IS ONLY MODERATELY REDUCED (NOT MORE THAN HALF OF THE BODY WIDTH); THE ADORAL ZONE OF MEMBRANELLES CURVES ACROSS THE VENTRAL SIDE (AS IN MOST OXYTRICHIDS). IT IS RELATIVELY SHORT BEING NOT MORE THAN A QUARTER OF THE LENGTH OF THE BODY.
9 GEN STRONGYLIDIUM KS 551

PLUS A MARINE SUBGENUS WITH A NARROW TAIL.
SUBGEN UROSTRONGYLUM KS 555

21 (20) THE PERISTOME FORMS A DISTINCT NECK. THE ADORAL ZONE OF MEMBRANELLES REMAINS ON THE LEFT SIDE AND IS OVER A QUARTER OF THE LENGTH OF THE BODY. 22

22 (23) THE PERISTOME IS NOT, OR ONLY SLIGHTLY, FLEXIBLE.
11 GEN STICHOTRICHA KS 556

23 (22) THE PERISTOME IS LONG AND EXTENSIBLE.
12 GEN CHAETOSPIRA KS 560

24 (1) TRANSVERSE CIRRI ARE PRESENT BUT THEY ARE NOT ALWAYS EASY TO SEE. 25

25 (40) THERE ARE NO SPECIAL ISOLATED FRONTAL CIRRI ON THE FRONTAL FIELD, BUT THE VENTRAL ROWS EXTEND PARTLY OVER THE FRONTAL FIELD TO THE FRONT EDGE AND HERE FORM WEAKLY STRENGTHENED CIRRI. 26

26 (29) SMALL OVAL MARINE FORMS WITH A VERY LONG PERISTOME. 27

27 (28) The transverse cirri are small and do not reach the hind end.
13 gen CARYOTRICHA KS 563

28 (27) The transverse cirri are long and strong and extend beyond the back end.
gen STYLOCOMA KS 623

(These forms are insufficiently studied and I have placed them along with the Euplotidae).

29 (26) Otherwise, or not marine. 30

30 (31) Small freshwater forms with long isolated ventral cirri but without differentiated frontal cirri. The dorsal bristles are long. There is only one short ventral row in addition to the marginal rows. 18 gen BALLADYNA KS 591

(incl. Balladynopsis)

31 (30) Otherwise in body and ciliature. 32

32 (33) Very contractile marine forms with long tails (and an insufficiently described freshwater form is provisionally included in the genus).
16 gen EPICLINTES KS 569

Other forms which are not adequately described which have long retractile stem-like tails, and have been separated as the genus Mitra, are here left in the key with Epiclintes.

33 (32) Otherwise in form, or if with a tail then only moderately contractile. From freshwater.
34

34 (35) Commensal on different types of Hydra.
15 gen KERONA KS 569

35 (34) NOT COMMENSAL. 36

36 (39) MORE THAN TWO VENTRAL ROWS. 37

37 (38) THREE VENTRAL ROWS, FRONT ROWS NOT MARKEDLY PROMINENT.
SUBGEN TRICHOTAXIS KS 588

38 (37) MORE THAN THREE VENTRAL ROWS. THERE ARE TWO TO FIVE FRONT ROWS FROM WHICH ARE CLEARLY SEPARATED, AT THE FRONT EDGE, A FEW (3) INDISTINCT CIRRI.
14 GEN UROSTYLA KS 564

39 (36) ONE TO THREE VENTRAL ROWS.
17 GEN HOLOSTICHA KS 570 P 68

40 (25) THERE ARE ISOLATED AND CLEARLY STRENGTHENED CIRRI IN THE FRONTAL FIELD, AND ALMOST ALWAYS THE FIRST THREE ARE PARTICULARLY WELL DEVELOPED. 41

41 (46) THE VENTRAL CIRRI LIE IN A COLLECTION OF 1-6 ROWS. ANY ISOLATED CIRRI BEHIND THE MOUTH ARE NOT STRENGTHENED NOR MARKEDLY CONSPICUOUS. IN ONE GENUS THESE CIRRI ARE COMPLETELY ABSENT.
42

42 (43) THE VENTRAL CIRRI ARE IN FOUR OR MORE ROWS.
14 GEN UROSTYLA KS 564

43 (42) VENTRAL CIRRI IN ONE TO THREE ROWS OR ABSENT.
44

44 (45) VENTRAL ROWS ABSENT, MARINE FORMS WITH A NECK-LIKE REDUCED PERISTOMIAL REGION.
21 GEN TRACHELOSTYLA KS 596

45 (44) ONE TO THREE VENTRAL ROWS.
17 GEN HOLOSTICHA KS 570 P 68

46 (41) VENTRAL CIRRI ARE, AT LEAST IN PART, SEPARATED INTO GROUPS. 47

47 (56) Some of the ventral cirri lie in one to three distinct rows and there is a postoral and a hind group of a few isolated cirri. 48

48 (53) The unbroken ventral rows run along the long axis of the body and tend to be parallel. 49

49 (50) There is one unbroken row of ventral cirri to the left and two to the right. Transverse cirri lie in a row.
25 gen ONYCHODROMOPSIS KS 620

50 (49) The two transverse cirri on the right are well behind the three on the left. 51

51 (52) There is an unbroken ventral row on each side.
gen ALLOTRICHA KS 593

52 (51) There are two unbroken rows on the right.
19 gen PLEUROTRICHA KS 593

53 (48) The unbroken ventral rows clearly run obliquely from the front right to the left back. 54

54 (55) One oblique ventral row approaches the transverse row.
20 gen GASTROSTYLA KS 593

55 (54) Ventral rows are short, they extend little, if at all beyond the base of the peristome. The adoral zone of membranelles lies laterally.
22 gen GONOSTOMUM KS 597

56 (47) Unbroken ventral rows are absent (c.f. 55)
57

57 (58) The hind end of the animal is pulled out into a long thin spike.
23 gen ANCYSTROPODIUM KS 598

58 (57) The hind end is not pulled out as a spike.
59

59 (60) THERE ARE 12-15 STRONG DISTINCT CIRRI AT THE FRONT. THE NUCLEUS IS IN FOUR PARTS.

26 GEN ONYCHODROMUS KS 621

60 (59) THERE ARE FEWER CIRRI IN THE FRONT FIELD (MOSTLY 8 IN THREE GROUPS). THE NUCLEUS IS USUALLY BIPARTITE, RARELY WITH 1 OR 4 PARTS.

24 GEN OXYTRICHA KS 599 P 69

THE FURTHER BREAKDOWN OF SUBGENERA BELONGING HERE (STYLONYCHIA AND HISTRIO) WILL BE DEALT WITH WITH THIS (OXYTRICHA) GENUS.

SUBGENERA OF HOLOSTICHA KS 571

1 (2) BODY TAPERS POSTERIORLY AS A TAIL.
3 SUBGEN PARUROLEPTUS KS 586

2 (1) THE BODY IS OVAL OR ELLIPSOID. 3

3 (6) TWO VENTRAL ROWS. 4

4 (5) THE FRONTAL CIRRI ARE NOT, OR NOT CLEARLY, DIFFERENTIATED FROM THE AGGREGATION OF ROWS OF CIRRI. THE FRONT THREE CIRRI ARE NOT DISTINCT, OR ARE NOT CLEARLY SEPARATED FROM THE RIGHT VENTRAL ROW.
1 SUBGEN KERONOPSIS KS 571

5 (4) THERE ARE THREE DISTINCT SPIKES AT THE FRONT END OF THE FRONTAL FIELD.
2 SUBGEN HOLOSTICHA KS 578

6 (3) THREE OR ONE VENTRAL ROWS. 7

7 (8) THREE VENTRAL ROWS.
4 SUBGEN TRICHOTAXIS KS 588

8 (7) ONE VENTRAL ROW.
5 SUBGEN AMPHISIELLA KS 589

SUBGENERA OF OXYTRICHA KS 601

1 (2) THE HIND END IS DRAWN OUT, OR POINTED, LIKE A TAIL.
3 SUBGEN UROSOMA KS 606

2 (1) THE HIND END IS NOT DRAWN OUT AS A TAIL.
3

3 (4) THE RIGHT EDGE OF THE PERISTOME AT THE FRONT BENDS OVER LIKE A HOOK TO THE LEFT, PUSHING AGAINST THE ADORAL ZONE OF MEMBRANELLES, OR IS COILED LIKE A SPIRAL.
5 GEN STEINIA KS 611

4 (3) THE RIGHT FRONT EDGE OF THE PERISTOME AT MOST TURNS INWARDS ONLY A LITTLE, AND DOES NOT EXTEND BACK AS FAR AS THE ADORAL ZONE OF MEMBRANELLES.
5

5 (10) THE BODY IS SOFT AND FLEXIBLE AND SOMETIMES CONTRACTILE. 6

6 (7) THE MARGINAL ROWS ARE COMPLETE AT THE BACK.
1 SUBGEN OXYTRICHA KS 601

THERE IS A NOTEWORTHY MARINE FORM WITH A DISC-SHAPED PERISTOME WHICH SHOULD BE ADDED TO OXYTRICHA.

7 (6) THE MARGINAL ROWS ARE NOT COMPLETE AT THE BACK.
8

8 (9) THE HIND END HAS NO CAUDAL CIRRI.
2 SUBGEN TACHYSOMA KS 604

9 (8) HIND END HAS CAUDAL CIRRI.
4 SUBGEN OPISTHOTRICHA KS 608

10 (5) THE BODY IS STIFF. IT MAY HAVE SOME FLEXIBILITY WHEN THIN OR AS A PATHOLOGICAL CHARACTERISTIC.
11

11 (12) MARGINAL ROWS COMPLETE AT THE BACK. THERE ARE NO CAUDAL CIRRI.

6 SUBGEN HISTRIO KS 614

12 (11) THE MARGINAL ROWS ARE INCOMPLETE AT THE BACK. THE BACK END HAS STIFF BRISTLE-LIKE CAUDAL CIRRI.

7 SUBGEN STYLONYCHIA KS 617

GENERA OF EUPLOTIDAE KS 621

1 (2) THE FIRST THIRD OF THE BODY IS SEPARATED INTO A HEAD-LIKE REGION BY TWO LATERAL INDENTATIONS.
7 GEN DISCOCEPHALUS KS 641

2 (1) THE FIRST THIRD OF THE BODY IS NOT DISTINCT.
3

3 (8) THERE ARE NO SPECIALLY STRENGTHENED 'RUDDER' CIRRI NEAR THE HIND END. 4

4 (5) THE LEFT MARGINAL ROW REMAINS UNBROKEN. 4 NUCLEI. AN ELLIPSOID MARINE FORM.
1 GEN CERTESIA KS 623

5 (4) TO THE LEFT THE CIRRI ARE SOLITARY OR ABSENT. NOTE : THE INSUFFICIENTLY STUDIED MARINE GENUS STYLOCOMA FOLLOWS CERTESIA ON KS 623. 6

6 (7) THE FRONTAL PART OF THE ADORAL ZONE OF MEMBRANELLES LIES IN A FLATTENED GROOVE.
6 GEN EUPLOTES KS 628

7 (6) THE FRONTAL PART OF THE (ADORAL) ZONE (OF MEMBRANELLES) IS ISOLATED FROM THE DORSAL SURFACE BY A DEEP FUNNEL LIKE DEPRESSION.
4 GEN CRATEROMORPHA KS 626

8 (3) THERE ARE 1 OR 2 GROUPS OF POWERFUL RUDDER CIRRI NEAR THE HIND END. 9

9 (10) THERE IS A GROUP OF THREE STRONG RUDDER CIRRI TO THE RIGHT ONLY.
3 GEN DIOPHRYS KS 624

10 (9) IN ADDITION TO THREE VERY STRONG TERMINAL RUDDER CIRRI ON THE RIGHT EDGE, THERE ARE TWO MIGHTY CIRRI LOCATED MORE DORSALLY TO THE LEFT.
5 GEN URONYCHIA KS 626

SUBORDERS OF PERITRICHA KS 653

1 (2) The animals move freely on the substrate and have a well developed aboral organelle. The hind pectinellar wreath is a permanent, not a temporary thing. 1 suborder MOBILIA KS 653 P 73

2 (1) In the adult state, the cells adhere firmly to the substrate. The posterior band of cilia is present only in the swarmers. There are several pelagic forms which are exceptions and which always move freely using either the hind row of cilia (dubious genus Telotrochidium) or the peristomial cilia (Fam. Astylozoonidae).
2 suborder SESSILIA KS 661 P 74

GENERA OF MOBILIA KS 656

1 (4) THE OUTER CILIARY WREATH IS DELICATELY CONSTRUCTED, AND IS DIFFICULT TO RECOGNISE. 2

2 (3) THE ARMOUR OF THE ADHESIVE DISC IS COMPRISED OF SIMPLE TEETH LYING OBLIQUELY AND HAVING NO RADIAL APPENDAGES.
1 GEN URCEOLARIA KS 656

3 (2) THE TEETH OF THE DISC HAVE OUTER HOOK-LIKE STRUCTURES, AND STRAIGHT RADIALLY ARRAYED BITS ON THE INSIDE.
2 GEN TRICHODINA KS 657

4 (1) THE ADHESIVE DISC IS BORDERED WITH EASILY RECOGNISABLE CILIARY ORGANELLES. THERE ARE BRISTLES OR CIRRI WHICH ARE DIRECTED TOWARDS THE PERISTOME.
3 GEN CYCLOCHAETA KS 659

FAMILIES OF SESSILIA KS 664

1 (10) PERITRICHS WHICH DO NOT FORM TESTS BUT A FEW TYPES FORM A GELATINOUS STRUCTURE, IN THE TUBES OF WHICH THEY PARTLY HIDE AND INTO WHICH THEY CAN WITHDRAW BACKWARDS.
1 TRIBE ALORICATA KS 664 2

2 (3) THE HIND END HAS ONE OR TWO SHORT SPINES, THESE CELLS SWIM WITH THE PERISTOMIAL CILIA DIRECTED FORWARDS AND ARE APPARENTLY NEVER ATTACHED.
1 FAM ASTYLOZOONIDAE KS 664 P 76

3 (2) THE HIND END IS ATTACHED TO THE SUBSTRATE, EITHER DIRECTLY OR BY MEANS OF A STALK. 4

4 (5) ANTERIORLY, THE BODY IS DRAWN OUT INTO A VERY LONG CYLINDRICAL AND CONTRACTILE NECK. TYPICALLY THE CONTRACTILE VACUOLE LIES NEAR THE HIND END AND IS LINKED TO THE VESTIBULUM BY A LONGITUDINAL CANAL. THE RESERVOIR ADJACENT TO THE CONTRACTILE VACUOLE IS VERY DISTINCT. THE SCOPULA MAY OR MAY NOT HAVE A VERY THIN STALK.
5 FAM OPHRYIIDAE KS 752

5 (4) THERE IS NO NOTICEABLE NECK REGION AT THE FRONT OF THE BODY. 6

6 (7) THE HIND END DOES NOT HAVE A STALK ARISING FROM THE SCOPULA BUT HAS A STALK-LIKE TAPERING OF THE BODY ABOVE THE SCOPULA.
2 FAM SCYPHIDIIDAE KS 667 P 77

7 (6) THE BACK END HAS A STALK ARISING FROM THE SCOPULA. 8

8 (9) THE STALK HAS NO CONTRACTILE FIBRE.
3 FAM EPISTYLIDAE KS 672 P 78

9 (8) THE STALK HAS A CONTRACTILE FIBRE.
4 FAM VORTICELLIDAE KS 707 P 80

10 (1) PERITRICHS FORMING A STIFF PSEUDOCHITINOUS TEST WITH A SHARP PROFILE.
2 TRIBE LORICATA KS 757 11

11 (12) THE EDGE OF THE PERISTOME IS NOT UNITED WITH THE TEST. THE INFUSORIA ADHERE TO THE TEST ONLY BY THE HIND END AND FROM WHICH THEY CAN PROJECT FREELY BY EXTENDING THEIR BODIES.
1 FAM VAGINICOLIDAE KS 757 P 81

12 (11) THE BODY IS ASSOCIATED WITH THE INVERTED EDGE OF THE OPENING OF THE TEST. ON EXTENSION ONLY A STALKED DISC EXTENDS OUT OF THE HOUSE.
2 FAM LAGYNOPHRYIDAE KS 793

GENERA OF ASTYLOZOONIDAE KS 664

1 (4) The upper surface is smooth or grooved but not having small spikes. 2

2 (3) Not having a gelatinous sheath.
1 gen ASTYLOZOON KS 664

3 (2) With a gelatinous sheath.
2 gen GELEIELLA KS 666

4 (1) The upper surface has 2 or 4 wreaths of obvious small plasmatic spikes.
3 gen HASTATELLA KS 667

GENERA OF SCYPHIDIIDAE KS 667

1 (2) On fish and amphibia, the nucleus is obconical and lies in the hind end.
1 gen GLOSSATELLA KS 668

2 (1) Nucleus otherwise. 3

3 (8) The hind end is simple, not drawn out into a forked extension used for attachment. 4

4 (5) The hind end of the body does not taper like a stalk, at most it is pulled out for a short distance and then widens to an adhesive disc.
2 gen SCYPHIDIA KS 669

5 (4) The hind end is more or less gradually drawn out into a slender stalk-like structure. 6

6 (7) The hind end is slim and tapers like a pear.
2 gen SCYPHIDIA KS 669

7 (6) The hind end is drawn out into a stalk.
3 gen PARAVORTICELLA KS 671

8 (3) There are two cylindrical arms extending from the hind end and these connect around the bridges between the gill plates of the mussel Donax vittatus.
4 gen ELLOBIOPHRYA KS 672

GENERA OF EPISTYLIDAE KS 673

1 (4) THE STALK DOES NOT BRANCH AND IS MOSTLY SHORT, ONE TO THREE TIMES THE LENGTH OF THE BODY. THE EXPERIENCE OF THE AUTHOR IS THAT WITHIN A SINGLE POPULATION OF SOME SPECIES ONE MAY ENCOUNTER ONLY A SINGLE FORM, BUT ALSO SOMETIMES A BRANCHED FORM (SEE PENARD). COMPARE WITH 4 BELOW.
2

2 (3) THE PERISTOME IS SURROUNDED ON THE OUTSIDE BY A PERIPHERAL FOLD. USUALLY WITH A FLAT, BROAD UNSTALKED DISC.
1 GEN RHABDOSTYLA KS 673

3 (2) WHEN THE PERISTOME IS OPEN, THERE IS NO LIP STANDING OUT FROM THE BODY. THE DISC IS USUALLY SMALL AND ON A STALK EXTENDING, USUALLY OBLIQUELY, FROM THE PERISTOME. 3 GEN PYXIDIUM KS 695

PHYLOGENETICALLY, THIS GENUS APPEARS TO BELONG TO A POSITION ADJACENT TO OPERCULARIA. AS THEY MAY BE EASILY CONFUSED WITH RHABDOSTYLA THE FIGURES ARE ON THE SAME PLATE, AND THE GENUS PYXIDIUM DIRECTLY FOLLOWS RHABDOSTYLA.

4 (1) THE STALK BRANCHES DICHOTOMOUSLY, LIKE A TREE.
5

5 (6) THE PERISTOME IS AS IN RHABDOSTYLA.
2 GEN EPISTYLIS KS 680 P 79

6 (5) THE PERISTOME IS AS IN PYXIDIUM.
4 GEN OPERCULARIA KS 698

BETWEEN PYXIDIUM AND OPERCULARIA IS THIS FORM FROM THE GILL PLATES OF TERRESTRIAL ISOPODS.
5 GEN BALLODORA KS 707

SUBGENERA OF EPISTYLIS KS 680

1 (6) THE PERISTOME DESCRIBES ONLY A LITTLE MORE THAN ONE REVOLUTION. 2

2 (5) THE PERISTOME IS OPEN FREELY WHEN EXTENDED. 3

3 (4) STALKED ZOOIDS FORM UMBELLIFORM ARRAYS AT THE BROADENED END OF EACH BRANCH.
3 SUBGEN SYSTILIS KS 694

4 (3) THERE IS ONE ZOOID ON EACH BRANCH.
1 SUBGEN EPISTYLIS KS 681

5 (2) THE PERISTOME REMAINS INVAGINATED AT ALL TIMES AND IS SURROUNDED BY A COLLAR. A DUBIOUS MARINE GENUS. 4 SUBGEN ORTHOCHONA KS 694

6 (1) THE PERISTOMIAL REGION DESCRIBES 4-6 REVOLUTIONS.
2 SUBGEN CAMPANELLA KS 693

GENERA OF VORTICELLIDAE KS 710

1 (2) THE STALK MUSCLE IS WEAKLY DEVELOPED AND IS OFTEN DIFFICULT TO SEE: IT LIES MOSTLY IN THE UPPER PART OF THE STALK. SOLITARY, OR IN SMALL, LOW EPIZOITIC COLONIES. 1 GEN INTRANSTYLUM KS 711

2 (1) THE STALK MUSCLE IS CLEAR AND TYPICALLY DEVELOPED. 3

3 (4) THE STALK IS UNBRANCHED. 2 GEN VORTICELLA KS 712

4 (3) THE STALK IS DICHOTOMOUSLY BRANCHED, FORMING MORE OR LESS LARGE COLONIES. 5

5 (6) THE MYONEMAL THREAD OF THE STALK IS NOT BROKEN: WHEN THERE IS A CONTRACTION, THE WHOLE COLONY CONTRACTS. 4 GEN ZOOTHAMNIUM KS 740

6 (5) THE MYONEMAL THREAD IS SEPARATE FOR EACH INDIVIDUAL, BEING BROKEN AT EACH DIVISION. EACH ANIMAL CAN CONTRACT INDEPENDENTLY. 3 GEN CARCHESIUM KS 736

GENERA OF VAGINICOLIDAE KS 759

1 (12) THE LORICA STANDS UPRIGHT, WITH OR WITHOUT A STALK, IT IS NOT ATTACHED BY THE BROAD SIDE. 2

2 (5) THE LORICA IS NOT SEALED BY A FLAP NOR A PLUG-LIKE LATERAL THICKENING OF THE FRONT (OF THE CELL). REMAINS OPEN DURING CONTRACTION. 3

3 (4) THE LORICA HAS NO STALK, IT IS ATTACHED DIRECTLY TO THE SUBSTRATE BY THE HIND END.
1 GEN VAGINICOLA KS 759

4 (3) THE LORICA HAS A STALK.
2 GEN COTHURNIA KS 769

5 (2) THE LORICA IS CLOSED BY A FLAP OR A PLUG DURING CONTRACTION. 6

6 (9) THERE IS A FIXED FLAP INSIDE, OR AT THE APERTURE OF THE LORICA, WHICH SERVES AS A CLOSING DEVICE. 7

7 (8) THE FLAP IS INSIDE, THE LORICA MAY OR MAY NOT HAVE A STALK. 3 GEN THURICOLA KS 784
AND PSEUDOTHURICOLA

8 (7) THE FLAP IS AT THE EDGE OF THE APERTURE.
4 GEN CAULICOLA KS 786

9 (6) THE CLOSURE IS EITHER A LATERAL FLAP FROM THE FRONT END OF THE BODY OR IT IS A THICKENING OF THE BODY WHICH ACTS LIKE A PLUG. 10

10 (11) THE SHUTTING DEVICE IS A PSEUDOCHITINOUS FLAP.
3 GEN PYXICOLA KS 787

11 (10) THE SHUTTING DEVICE IS A PLASMATIC PLUG.
6 GEN PACHYTROCHA KS 790

12 (1) THE HOUSE IS FIXED BY ITS BROAD SIDE AND HAS A MORE OR LESS CLEAR PROJECTING NECK REGION.
7 GEN PLATYCOLA KS 790

GENERA OF SPIROCHONIDAE KS 802

1 (6) THE PERISTOMIAL FOLD IS SIMPLE, AND NOT ROLLED INTO A SPIRAL AT ITS ABORAL END, AND NOT WITH A NOTICEABLE INTERNAL FUNNEL. 2

2 (3) THE PERISTOME FORMS A MOUTH-LIKE SLIT, AND THE TWO LIP-LIKE EDGES OF THIS ARE NOT SEPARATED BY A NECK-LIKE CONSTRICTION OF THE BODY.
1 GEN CHILODOCHONA KS 802

3 (2) THE PERISTOME HAS A SIMPLE MEMBRANOID FUNNEL WHICH IS EXPANDED OUTWARDS. 4

4 (5) THE EDGE OF THE PERISTOME HAS NO, OR FEW, SPIKES.
2 GEN KENTROCHONA KS 802
AND KENTROCHONOPSIS

5 (4) THE EDGE OF THE PERISTOME HAS NUMEROUS SPIKES.
3 GEN HELIOCHONA KS 803

6 (1) THE PERISTOMIAL FUNNEL EITHER IS SPIRALLY ROLLED OR HAS AN INNER FUNNEL. 7

7 (8) THE PERISTOMIAL FUNNEL IS SPIRALLED AT ITS ABORAL END. 4 GEN SPIROCHONA KS 804

8 (7) THE PERISTOMIAL FUNNEL HAS A SECOND INNER FUNNEL.
5 GEN STYLOCHONA KS 805

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